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SOUTHWESTERN MEDICINE

VOLUME VIII NOVEMBER, 1924 No. 11

Official Organ of the New Mexico Medical Society, Arizona State Medical Association, El Paso County (Texas) Medical Society and the Medical and Surgical Association of the Southwest

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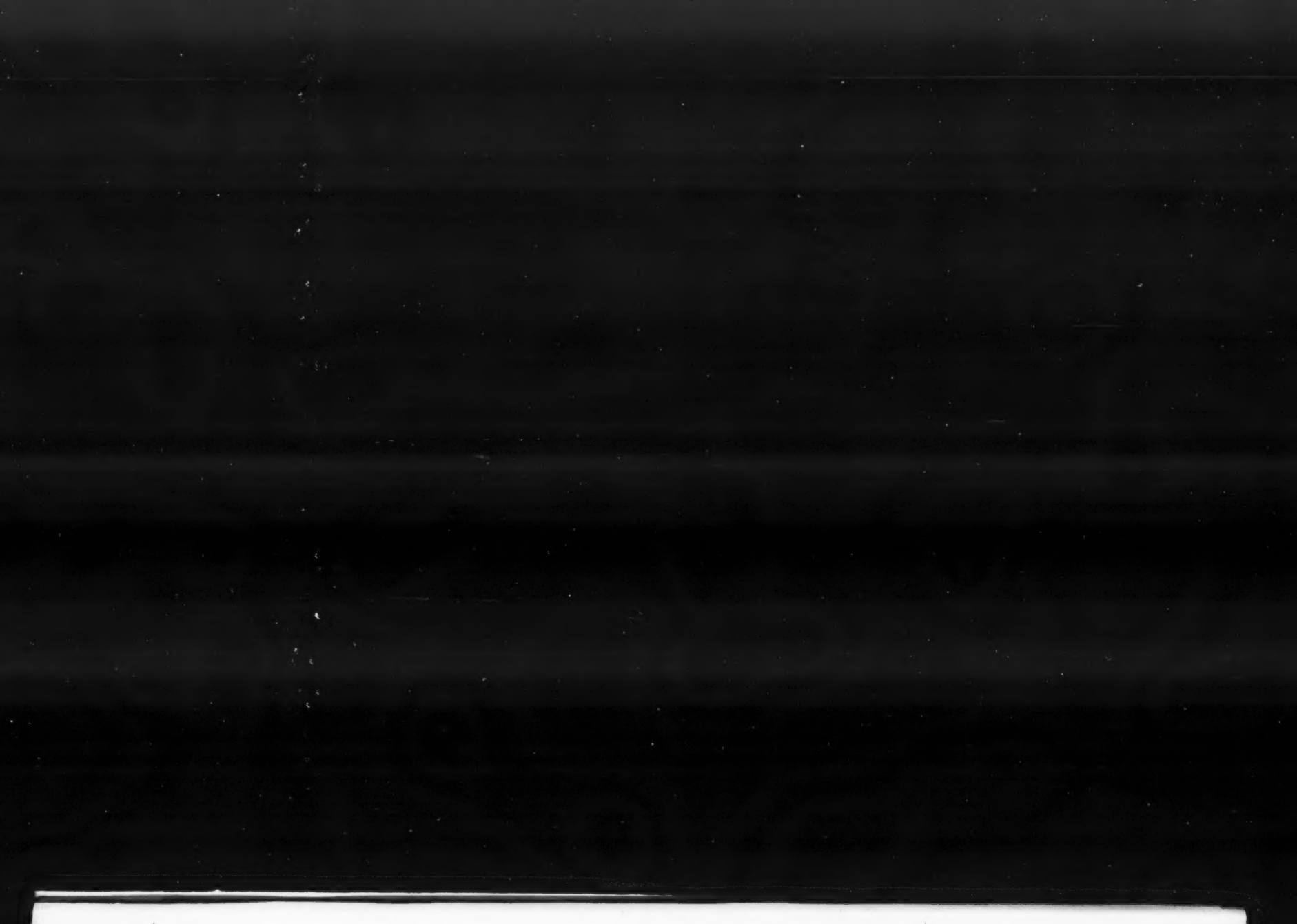

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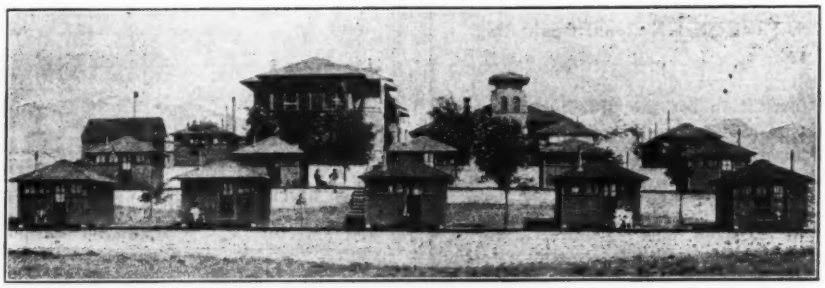

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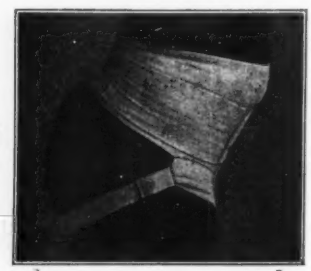

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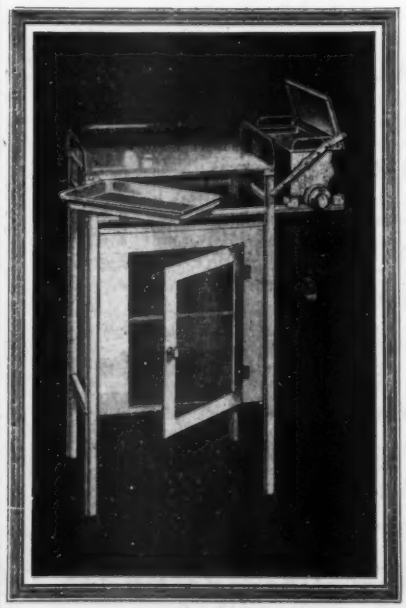

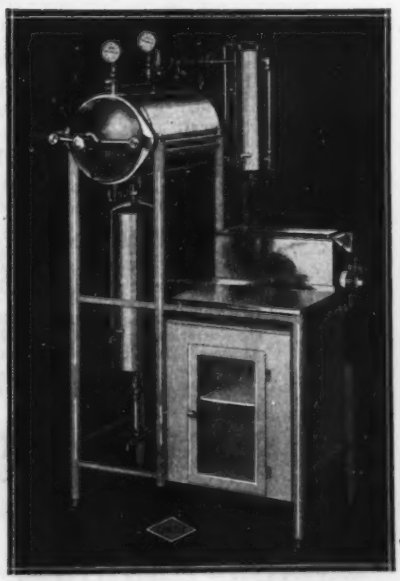

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THE HISTORY OF THE MEDICAL DEPARTMENT OF THE ARMY AND SOME NOTEWORTHY MEDICAL OFFICERS

M. A. W. SHOCKLEY, Lt. Col., M. C., U. S. A.

In presenting these subjects, it is my desire and that of my associates to disclaim any original research, but to admit frankly that, like Kipling—

"When 'Omer smote 'is bloomin' lyre
'E'd 'eard men sing by land and sea,
And what he thought he might require
'E went and took—the same as me."

We have taken the matter piecemeal or in toto from the several students and writers given in the bibliography, using their thoughts and language wherever it seemed advantageous. This history is taken largely without change from Colonel Kean's monograph.

The short biography of General Gorgas is taken with little change from Dr. Franklin Martin's monograph.

The first semblance of an Army Medical Department of the United States was created by the Provincial Congress of Massachusetts Bay Colony, which created Surgeons, after examination, for the several regiments raised in May, 1775. It is said of this examination that one of the candidates, having been asked how he would promote sweating in a rheumatic patient, replied: "I would have him examined by a medical committee."

After the battle of Bunker Hill (Breeds), hospitals were established in the vicinity and Congress issued warrants to surgeons and mates. At this time the entire medical establishment was termed "the Hospital."

The Medical Department proper of the United States Army had its beginning on the 27th of July, 1775, when the Colonial Congress at Philadelphia voted a medical establishment, or, as it was then called, "an hospital," for the Army. Prior to this enactment the surgeons of the forces before Boston had been appointed by the colonels of regiments. Of course, among these surgeons there could be no cohesion or effective co-operation, and, as General Washington wrote to the Congress at Philadelphia, affairs were in a very unsettled condition. "There is no principal director nor any subordination among the surgeons; of consequence, disputes and contentions have arisen, and must continue until it is reduced to some system."

The first department consisted of the director general and chief physician, four surgeons, twenty surgeons' mates, an apothecary, a clerk, two storekeepers, and a nurse to every ten sick. It may be of interest to mention that the pay of these officers was as follows: The director general, $120; the surgeons, $40; the

(An historical symposium by officers of William Beaumont General Hospital, U. S. A.)

surgeons' mates, $20; the storekeepers, $4, and the nurses, $2 a month.

Dr. Benjamin Church of Boston was elected director general, and he was given the appointment of all the personnel of "the hospital", except the surgeons' mates, who were appointed by the surgeons. Dr. Church had a reputation for culture and professional skill, but was, a few months after his appointment, detected in treasonable correspondence with the enemy, deposed and thrown into prison. He was succeeded by Dr. John Morgan of Philadelphia, a man of much energy and administrative ability as well as professional skill. He soon gained the friendship and support of General Washington, and these he always retained.

With the extension of the theater of war, the number of surgeons was increased, and Drs. Skinner and Shippen were named chief surgeons for the northern department and the forces on the west bank of the Hudson. The organization was, however, too loose to secure efficiency or concert of action. The relations of the regimental surgeons to each other and to those in charge of the general hospitals were entirely undetermined, and the department surgeons refused to admit the authority over them of Dr. Morgan. There was besides no well-arranged system of medical supply, and in consequence there was much suffering, and complaints multiplied. As has happened since, more than once, Dr. Morgan was punished for the very shortcomings for which he had in vain asked Congress to provide a remedy, and he was dismissed in January, 1777. Congress the next year exonerated him from all blame, but did not reinstate him.

A complete and elaborate organization of the medical department, modeled on that of the British Army, was adopted in April, 1777, and Dr. William Shippen was elected director general of the new establishment. Deputy director generals were provided for the northern and southern departments, and under these a physician general and surgeon general in each district, "whose business it shall be to superintend the practice of physic and surgery in all the hospitals of the district." This separation of the practice of physic and the practice of surgery, which obtained in Europe at that time, and in England, has, in civil life, lasted until the present day, necessitated a most cumbrous and awkward dual organization, which soon disappeared under the rudely practical test of war. It is probable that most American physicians at that time, outside the larger cities, practiced surgery to some extent, in addition to the practice of physic. The regimental surgeons seem from the first to have combined the two arts, and we find in the bill, which, in 1780, reorganized and simplified the medical establishment, an explicit provision that "there shall be three chief hospital physicians who shall also be surgeons, one chief physician who shall also be a surgeon, one chief physician who shall also be a surgeon to each separate army, fifteen hospital physicians who shall also be surgeons," etc. But although the medical officers of the Army thereafter appear to have been both physicians and surgeons, the former title seems to have been rather reserved for the higher grades, while the title "surgeon" became by the end of the Revolutionary War generic for all medical officers.

At the end of the Revolution the Army was disbanded, except fifty-five men at Fort Pitt and twenty-five at West Point to guard the military stores at these places. The officer highest in command was a captain, and the medical department was reduced to the vanishing point. The Revolution had produced a number of distinguished military surgeons, among whom were Cochran, John Warren, Craik and Tilton, in addition to those already named. The pressure of Indians on the western frontier after a few years prevailed over the morbid fear of a regular army with which our ancestors of a century ago were possessed, and in

1789 a regiment of regular infantry and a battalion of artillery were organized, with a medical service of one surgeon and four surgeons' mates.

Our first hospital regulations were drafted by Dr. John Morgan, after conference with Washington, in 1776-77. Dr. Morgan published several works of merit on the practice of medicine and with Dr. Shippen assisted in founding the Medical School of the College of Philadelphia.

Baron Von Stuben drafted the first army regulations in 1780 and included therein several medical department regulations.

In 1778 Dr. William Brown, Physician General, published anonymously the earlier American Pharmacopoeia.

In 1777 Benjamin Rush published a pamphlet on "Hygiene of Troops."

In 1777 Dr. Shippen planned the flying ambulance. He was one of the founders of the Medical School of the College of Philadelphia and occupied the Chair of Anatomy and Surgery.

On demobilization after the Revolution, the Hospital Department was practically abolished. June 2, 1784, the army had 80 privates.

In 1792 the army was reorganized as a legion of 5,120 men, with Richard Allison as Surgeon to the Legion.

May 3, 1798, Congress authorized an army of 10,000 men and James Craik was appointed Physician General. These forces were disbanded in 1800. Dr. Craik was a companion of General Washington during his early wilderness adventures, a noted practitioner of the day and the involuntary cause of Washington's early death.

The War of 1812 brought an army again in the field, but as the medical department was without a head and the surgeons had not even assimilated rank, good medical administration was impossible. In March, 1913, Congress created the positions of physician and surgeon general and apothecary general, the latter to act as assistant to the former, and as medical purveyor. The surgeons were divided into hospital and regimental surgeons, of which the former were superior in rank and pay. Both had mates or assistants, and there were in addition post surgeons who ranked with the mates.

The title of surgeon general appears first in the Act of May 14, 1818. Joseph Lovell was appointed to this position, and in that year he made the first annual report of the surgeon general to the Secretary of War, and also drew up a set of regulations for the medical department. He remained for eighteen years at its head, and during that time, by his ability and force of character, shaped and organized the corps of army surgeons into a coherent and efficient medical staff. It was during the tour of Surgeon General Lovell that Surgeon William Beaumont made his scientific investigations of the functions of the stomach and gastric digestion. Surgeon General Lovell was succeeded by Thomas Lawson, a man of strong character and fine professional and administrative abilities and withal a brave and ardent soldier, and a most original character. He entered the navy in 1809 as surgeon's mate, but left that service for the army in 1811. His service as a medical officer of the army covered the remarkable period of fifty years and three months, and included active and distinguished service in the War of 1812, the Indian Wars and the Mexican War. When he became surgeon general, in 1836, medical officers were without military rank, and in addition to the great disadvantages of such a status, suffered frequently from the insolence and contempt with which the line officers of that day, following the traditions of the British service, were inclined to regard the medical profession. Surgeons, for example, were not entitled to a salute from enlisted men, and when serving on boards were ranked by the youngest subaltern in the service. In the new uniform, adopted in 1839, they were allowed a sword, but not the officers' epaulettes, an aiguilette being prescribed instead; "a piece of tinsel on one shoulder," as Lawson contemptuously described it.

To establish and maintain the dignity of his profession and his corps, was to Thomas Lawson a sacred mission, to which he devoted himself with such courage, pertinacity and keenness of wit that he achieved success in the all important claims advanced in behalf of his corps, culminating in the Act of February 11, 1847, which conferred on medical officers the assured and honorable status of definite military rank. It is a tradition in the service that on the passage of this act the grim old fighter sent around to medical officers a confidential circular to the effect that now that they had the status of officers they must promptly challenge any other officer who failed to show them proper respect. This they did not fail to do and the army mortality statistics took a sudden jump.

The medical service of the Mexican War seems to have been performed with the same efficiency, courage and devotion to duty which marked all the operations of the small but glorious armies under Scott and Taylor, and such men as Satterlee, Tripler, Simpson, Cuyler, Wright, Moore and Barnes laid in it the foundation of reputations which were destined to grow under the far wider responsibilities of the Civil War. In the fierce assault of Molino del Rey, Assistant Surgeon William Roberts was killed and Assistant Surgeon James Simons were wounded.

The thirteen years which intervened between the Mexican War and the outbreak of the Civil War were years of activity and progress for the medical corps, although the Utah Expedition against the Mormons in 1858 was the only military event of note. An important advance in the standard of examination for admission was made in 1849, when a knowledge of Latin, of physics, of practical anatomy in the form of dissection, and clinical experience acquired either in a hospital or in private practice were made prerequisites. In 1850 the Medical Department of the Army was first formally represented at the annual meeting of the American Medical Association.

The Civil war was the first in which large armies made their appearance on American soil, and in these great army corps of volunteers many of the glorious traditions and hide-bound prejudices of the old army disappeared along with its regiments and batteries. Yet it was none the less the leaven hid in three measures of meal, which leavened the whole lump, and this is true not less of the Medical Department than of the line.

On January 1, 1861, the army numbered 16,400 and the medical officers 115, or .7 percent of the whole—a considerably greater proportion, by the way, than exists today. Although by far the largest of the staff corps, it had the smallest proportion in the higher grades, and this also is still the case, with the single exception of the Signal Corps, the junior of all, whose handicap is perhaps a matter of inheritance, as its originator, Myer, was a medical officer.

The medical history of the Civil War marks an epoch in military sanitary organization even greater than was made in the art of war by Sheridan's use of cavalry or the hasty entrenchments of Lee. It is a glorious chapter of American history, but the full story of the ability and devotion of the surgeons of the Civil War, regular and volunteer, must be sought, not in the limits of an article, but by those who have industry and good eyesight, in the ponderous volumes of microscopic print which make up the "Medical and Surgical History of the Rebllion."

Surgeon General William Alexander Hammond, 1862-1864, was preeminent during this period as a neuropsychiatrist. He wrote a standard text on neurology and many other works. He quarreled with Secretary of War Stanton and was tried and dismissed. History shows that it was not difficult to displease Secretary Stanton.

Other medical officers of this period of noteworthy achievements were:

Jonathan Letterman, who founded medical field organization which has been the basis of all American and European field organizations.

McParlin, medical administrator.

Keene, later noted as a surgeon.

Smart, a noted medical administrator.

Tripler, medical administrator.

John Shaw Billings, a noted medical bibliographer and organizer of the Surgeon General's Library and Museum.

The idea of medical organizations in the field, drilled and trained to gather up the wounded from the battlefield, transport and care for them, developed by Larrey and Percy in the Napoleonic wars, had perished with the armies of the First Empire under the retroactive prejudices of the old monarchies, and the military taboo of even republican America forbade a physician to exercise the sacred function of "command" over trained enlisted assistants of his own department or even to have a permanent and unquestioned jurisdiction over the mules and drivers of the medical ambulances. He controlled in battle his own two hands, and these only, unless the colonel saw fit to give him the uncertain and doubtful assistance of the regimental band.

The admirable medical organization of Letterman disappeared with the armies of Grant and Sherman, and Congress, weary of war, could not be induced to take interest in any military matter, except in the direction of reduction and economy. While all other nations made haste to apply the lessons of our war and to remodel their medical organizations in accordance with them, our own Medical Department reverted to antebellum conditions and went backward. The hospital stewards were the only permanent enlisted personnel and all nursing and other work about the hospitals was done by an uninstructed and constantly changing personnel of men detailed from the companies.

No worse system could have been invented, and yet it lasted twenty-two years, until, in 1887, the first step toward a modern organization was made by the establishment of a hospital corps, consisting of privates and two grades of non-commissioned officers. The medical officers then began the systematic training of the personnel and the study of modern medical organization with a view to war conditions. This movement unfortunately was misunderstood by the officers of the line and met, especially at first, with much ridicule and covert opposition, the use of military titles by medical officers being especially resented. In 1892 the Army Medical School was established in Washington for the instruction of young medical officers in hygiene, medical administration and other branches of special importance in military medicine. The influence for good of this school has been already marked and is constantly widening, and now that the course has been thrown open by act of Congress to officers of the organized militia, it has become an institution of national importance, and together with the Medical Field Service School, established by Surgeon General Ireland at Carlisle Barracks, Pa., in 1919, serves to give medical officers excellent military training.

The outbreak of the Spanish War in 1898 found the Medical Department with a personnel of 177 commissioned officers and 750 enlisted men. The number was barely sufficient to perform the medical service of the regular army of 25,000 men in time of peace. When a volunteer army of 250,000 men was mobilized, and at the same time an expedition embracing practically the entire regular army was organized to attack Santiago, it was immediately evident that if the regular regiments were to be cared for by regular medical officers, but few would be left to organize the medical service of the volunteer armies. Each of the volunteer regiments brought with it into service three regimental surgeons and three hospital stewards, but no privates. The regimental and field hospitals had to be organized at the expense

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of this regimental medical personnel. The enlisted strength of the regular hospital corps was inadequate for 25,000 men, and as Congress failed to authorize the enlistment of volunteer Hospital Corps men, the situation in this respect became at once acute, and was only partially relieved by the clumsy expedient of authorizing the transfer of men from volunteer regiments to the regular Hospital Corps.

In the reorganization of the army by the act of February 2, 1901, no attention was paid to the recommendation of this commission or to those of the surgeon general, and the proportion of medical officers was not only not increased, but was greatly reduced, while their prospect of promotion was taken away by disproportionate increase in the lower grades.

During this period General George Miller Sternberg served as Surgeon General, 1893-1912. He was a noted bacteriologist and in addition to developing this study in the United States, pursued many original investigations. He wrote "The American Textbook of Bacteriology."

During General Sternberg's term the epoch-making proof of the means of transmission of yellow fever was established by Major Reed, Captain Carroll and Lieutenants Lazear and Agramonte of the Army, and the means of prevention demonstrated by Major Gorgas, afterward sanitarian for the world, and Surgeon General of the Army.

From 1902 to the present date the history of the Medical Department has shown a material advance in the standing organization and scientific attainments of the organization as a whole and the personnel as individuals. By the act of 1908 the various corps were differentiated and the officers given actual rank in their corps rather than assimilated rank.

Actual field organizations for field service have been organized, maintained, modified and improved, in accordance with changed conditions. While suffering many reductions and changes due to congressional action, and need for economy, the basic organization of the Medical Department exists and constant study is being made to have the organization as nearly ready for expansion for field service as American political conditions will permit.

The Medical Department under Surgeon Generals Farwood, O'Reilly, Torney, Gorgas and Ireland was organized before and during the World War, so that of all departments of the army, it showed that it had no superior. Since the war it has continued material improvement. The most noteworthy improvements in organization since the Spanish-American War have been the establishment of the Nurse, Dental and Veterinary Corps and their Reserve Corps, and organization of Division, Corps, Army and Communications Zone, Medical Service, in co-ordination with the general organization of the Army. This organization permitted the United States to enter war (the World War) with a pre-formed system which did not require any general modification.

Medical personnel noted for scientific attainments during the period after the Spanish-American War, not mentioned elsewhere:

William Henry Farwood, Surgeon General 1912. Surgeon and prolific writer on surgery.

Lt. Col. Edward B. Vedder. Investigation and proof of food deficiency cause of beriberi.

Col. Edward L. Munson—Sanitarian. Author of Military Hygiene and one of the first teachers of medical tactics.

Lt. Col. Charles F. Craig, Bacteriologist and Helminthologist.

Lt. Col. Fielding H. Garrison, Medical Historian and Bibliographer.

Col. Louis A. La Garde. Specialist in gunshot wounds.

Col. Paul F. Straub. Published first book on medical field service. Medical service in campaign.

Col. Frederick Russel—Bacteriologist and Serologist. Introduced and symtematized American method of typhoid vaccination.

Col. Bailey K. Ashford—Sanitarian. Organized and maintained sanitation of Porto Rico. Eradicated hookworm infection.

We might have included many other medical officers of note with those mentioned during the past centuries and present decades, but I fear that we have already taken too much time. Many of those of past decades, I have not mentioned, you will remember. Many noteworthy medical officers of the present decade have been omitted because they are too contemporaneous to permit full valuation of their work at this time.

THE LIFE OF WALTER REED

S. M. BROWNE, Major, M. C.

Walter Reed, to whom the nineteenth century owed the last of her goodly array of scientific studies and discoveries, was born in Gloucester County, Virginia, September 13, 1851. The Reed family were of English extraction, descendants of Cir Christopher Reed of Chyp Chase Castle. His father was a North Carolinian by birth, though he spent forty years of his life in Virginia, as a minister of the Methodist Church.

Walter was the youngest of five children, four of whom were sons and the oldest a daughter.

The first years of his life were spent at Farmersville, Prince Edward County, Virginia, and here, at six years of age, he began his early education at a small private school kept by a Mrs. Booker.

His early childhood traits were always those of a gracious and jolly personality, finding a certain amount of pleasure in all things, but at an early age he began to manifest certain characteristics that made him distinguished in after life, namely—force of character, passionate desire for knowledge, with a keen sense of humor.

When he was at the age of 10, Civil War began. This, however, did not interfere with his early education, as he continued to study, except for one year, when all schools were closed. Early after the close of the Civil War, 1865, the Reed family moved to Charlottesville, Va., where young Reed entered a private school owned by a Mr. Abbott, a graduate of the University of Virginia.

He was well advanced for his age in the ordinary studies, but up to this time showed no especial liking for any science. He remained with this instructor for two sessions and entered the University of Virginia by special dispensation, when he was only sixteen. It was his earnest desire to finish his course, but as his two brothers were there also, and on account of the limited means of his father, this was impossible, he applied to the faculty to be certificated in the work that he had done, but this was refused on the ground of extreme youth. He then inquired of the faculty whether he would be allowed to take the degree of Doctor of Medicine provided he could pass the required examination. To this the faculty silently assented, thinking that the undertaking was an impossibility for so young a man. Reed at once began the study of medicine and graduated nine months later, in the summer of 1869, standing third in his class. The Dean remarked, as he presented his diploma, that he was the youngest student ever graduated from the Medical Department of the University of Virginia, but as he had fulfilled every requirement, the faculty was in honor bound to graduate him.

A few months after graduation, he went to New York and matriculated at the Bellevue Hospital Medical College, where he received the degree of Doctor of Medicine one year later. This being Reed's first visit to a large city, he made use of it to better himself in other lines, as well as that of

medicine. He never neglected an opportunity to hear speakers on literature, science and even law, as well as to enjoy good music and drama.

After finishing his course at Bellevue he served in several of the New York hospitals. Later he was appointed a charity physician to one of the poorer districts of New York and here came in contact with the real hardships and poverty of a large metropolis. While at one of the large Brooklyn hospitals he attracted the attention of Dr. Hutchinson, then the leading physician of Brooklyn, and through his influence was appointed one of the five inspectors of the City Board of Health. At this time he was only 22 years of age, but had established himself as a man quite versed in the art of surgery, as well as other lines of medicine.

In June, 1874, Reed paid a visit to his father in North Carolina, and during his stay in North Carolina he met Miss Emile Lawrence, who afterwards became his wife. On his return to New York he began to correspond with Miss Lawrence. Later in the year (1874) he made up his mind to give up the idea of general practice, and became an Army surgeon. His reasons, like those of many others, were that success in general practice depended largely upon social standing and the possession of wealth. These resources he did not have to rely upon, so he decided that he had best follow a line where his future was secure and he could pursue scientific study and research.

Resolutions, once made, caused him to prepare for the coming examinations with his usual thoroughness, and after many months of hard study he successfully passed the required examinations and was commissioned as an Assistant Surgeon in June, 1875. His first station was Willet's Point, New York. In the spring months of 1876, shortly before his marriage, he was ordered to Arizona. He was married April 25, 1876, and in May, he, with his bride, departed for the west, to begin his tour of garrison duty. His first western station was Fort Lowell, Arizona, and while stationed in this country was changed many times. While never in the field of active campaign, he was among, hostile Indians most of the time. He served many tours of duty as post surgeon and as such he was generally liked. At this time in the Army the post doctor was the only doctor for miles around and was called upon by everyone in the country side. Dr. Reed was often summoned hastily to attend a child dying with diphtheria or a fracture of the worst kind—or, more trying than any, a difficult childbirth. His interest and devotion to children was always one of his outstanding traits and often when he found some little child in great need he would appeal to his wife to allow him to bring it into their home, where it could receive the proper care and attention. To this she always rebelled, knowing that if she gave in their home life would be destroyed. On one occasion during his rounds he came upon a small Indian girl so badly burned that her people had left her to die. Her life he succeeded in saving and retained her as a nurse for his children.

In all of Dr. Reed's gentleness his sense of personal dignity and justice was strong and he never allowed even his superiors to infringe upon his rights, and often during his years of post life he would appeal to higher authority for justice which he maintained was due him.

In 1881 Dr. Reed was ordered to Fort McHenry, Maryland, and while there he really laid the foundations for his future distinction. This course of study was entirely too brief, as he was transferred to post duty again, and after five years in Nebraska was sent to Alabama, and while there in 1889 he began to feel the need of time and opportunity to study. He received many disappointments when he first applied. Shortly afterwards, however, the order of things was beginning to change, he was given station in Baltimore, Md., with permission to study some line of profes-

sional work at Johns Hopkins University. Even then he was not free to pursue the lines that he wanted without certain restrictions. It was suggested that he pursue lines of bacteriology and pathology in relation to general medicine and surgery. To this he showed great interest, but replied that he had been sent there to learn to better care for the sick soldier and not to do laboratory work or research. He began his work on the clinical side of the hospital, but fortunately for himself and the country at large, he was required to remain for only a short while. A new surgeon general came into power, and then he was given a more or less roving commission—and in the lines of bacteriology especially he began to show the utmost promise.

The winters of '90 and '91 were years of great worth, and at Johns Hopkins he made use of his hours in the most efficient manner, meeting cultivated scientific men. He was ever interested in the late discoveries, following many of the newer ones that made their appearance about this time, such as the discovery of the tubercle bacillus by Koch, etc. He always followed very closely all investigations at the hospital, and it was here, under Dr. Clement, that he gained his knowledge of the bacillus of hog cholera, which afterwards served him in such good stead, in ruling out the so-called cause of yellow fever given by Sanarelli. After staying as long as he was allowed in Baltimore, he was sent again for a short period to the west. In 1893 he was ordered to Washington to duty as Curator of the Army Medical Museum and Professor of Bacteriology at the Army Medical School. Both institutions at this time were more or less in their infancy. At this time he was promoted to the grade of major. This promotion practically ended his garrison life, which had lasted 18 years, with fifteen changes of station.

Reed continued untiringly on his scientific studies, and after his first paper on "Contagiousness of Erysipelas", he was a constant contributor in some form to scientific medicine. The discovery of the Klebs-Loefler bacillus was of extreme interest to him and he never lost a moment to further the cause of control of the dreaded disease, diphtheria.

In 1898, when the Spanish-American War broke out, he experienced great disappointment in not being given a responsible position, to which he thought himself justly entitled. Later, typhoid began to rage among the volunteer troops. Dr. Reed was made chairman of a board to investigate the cause and the modes of transmission of this disease. The other members were Dr. Vaughn of Detroit and Dr. Shakespeare of Philadelphia. Their work resulted in the publication of the report of the committee under the title of "The Report of Origin and Spread of Typhoid Fever in the U. S. Military Camps during the Spanish-American War", which was made available for the medical profession at large. The book, in two volumes, was a monument in itself and will be of value always as an epidemiological guide. Among some of the points brought out were: (1) the transmission of typhoid fever by flies; (2) contact with patients, handling bedding, etc.; and (3) contaminated drinking water. In 1899, when the work of this commission was over, Dr. Reed returned to Washington and shortly afterwards was detailed to begin the study and investigations of yellow fever.

Previous to this date there had been much said about the discovery of the specific cause of yellow fever by Sanarelli, an Italian scientist, and upon this foundation a board of officers consisting of Dr. Reed with Dr. James Carroll were appointed to investigate this finding and compare it with Bacillus "X" of General Sternberg's discovery in 1887. They soon found that the bacillus of Sanarelli was identical with the cultural characteristics of hog cholera, and they at once began another line of investigations. This work was published in 1900, in the Journal of Experi-

mental Medicine, under the heading, "A Comparative Study of the Biological Characters and Pathogenesis of Bacillus X (Sternberg), Bacillus Icteroides (Sanarelli), and the Hog Cholera Bacillus (Salmon and Smith)."

Early in 1899 yellow fever appeared in the American troops in Havana, and a commission was sent to Cuba to study the etiology. The commission, consisting of Drs. Reed (chairman), Carroll, and Lazear, all non-immunes, and Dr. Agramonte, a Cuban immune. After the preliminary meeting, two courses were decided upon, one the study of the intestinal flora for the causative organism, and, secondly, the theory of the conveyance by insects, advanced by Dr. Finlay in 1881. Many articles and theories were naturally forthcoming at this time, but Dr. Reed was much impressed by the work of Dr. Carter, U. S. Public Health Service, on the interval between infecting and secondary cases, and a study of the time elapsing caused him at this stage to insist upon changing their plans radically. The search for the causative agent was not abandoned, but took on a more secondary phase. And the ways and means by which the disease was propagated from sick to well was given first place.

The work of Ross on Malaria in Tropical Countries afforded considerable food for thought. The thermal state of the island of Cuba was worthy of consideration. Finally, following the lead made by Dr. Finlay nineteen years before, they began on the mosquito, culex fasciatus, as a possible host in the mode of transmission. The line of work being finally decided upon and the infecting sources to be tested, the question arose as to the using of humans for subjects of experimentation. After careful consideration, the commission decided that the results, if positive, would be of sufficient service to humanity to justify the procedure, provided, of course, that each individual subjected to the disease was fully informed of the risk and gave his free consent, the commission subjecting themselves to it first.

The experiments were first made on Dr. Carroll by allowing him to be bitten by several mosquitoes that had fed on yellow fever subjects, and he, in a few days, developed the disease in its fullest extent. These same mosquitoes produced like effects on other individuals. Dr. Lazear was accidentally bitten and died in very short order from the disease. This experiment was continued with many others and was so promising that it caused Dr. Reed to report in October, 1899, that "the intermediate host of yellow fever was the mosquito." This report was published by Dr. Reed and his co-workers in October, 1900.

This part practically assured, they set about to disprove other so-called methods of infection or sources of transmission of yellow fever. A camp was established in which the clothing of patients dying with yellow fever was used entirely and volunteers allowed to remain therein for a period sufficiently long for them to develop the disease. Along with this, the biting of individuals with infested mosquitoes was continued with success. Many volunteers were infected. The theory of spread by fomites was thoroughly studied and disproved. The infection of individuals by blood inoculation from actual cases was proven beyond a doubt, by actual experiments. As to the value of these experiments, one has only to refer to the work of Major Gorgas in Cuba to be convinced of their effectiveness when put in actual practice. He, knowing and relying on the slow progress of yellow fever, set about to destroy the infecting source or to prevent the mode of transmission taking place. This was accomplished by screening the patients infected with the disease, and destroying all mosquitoes that might come in contact with the patient. As a result of these effective measures, Havana was freed of yellow fever in ninety days. The values of the yellow fever commission's reports are, of course, many. It has annihilated the dreaded dis-

ease yellow fever, and put out of existence a disease that caused in 100 years an average of 1000 deaths yearly. The saving in money would amount to billions of dollars.

After Reed's return to this country he held the chair of Bacteriology at the Army Medical School and Columbia University. He devoted his entire time to the art of teaching, to which he was naturally adapted, spending his spare time in research and writing. On his return to Washington, D. C., in October, 1902, from a short vacation in Pennsylvania, it was noticeable that his health was failing, although seldom mentioning it. It soon told on his physical strength, and on November 20, 1902, he consulted with Dr. Borden, a brother officer, who diagnosed his condition as appendicitis and operated upon him, but peritonitis ensued, and Dr. Reed died on November 22, 1902.

Recognition by the nation as a whole was not made of Reed's great work. No Congressional thanks or stipend was offered, but nevertheless the medical societies of our country and of all others have spared no words to eulogize him, and to praise his work—that alone will ever be a lasting monument to Dr. Reed's untiring devotion and contribution to medical science. Standing in the shadow of the capital is his only monument and the only expression of appreciation of his great work—the mammoth and well known Walter Reed General Hospital.

WILLIAM BEAUMONT

CAPT. L. A. LAVANTURE

William Beaumont was born November 21, 1785, at Lebanon, Connecticut. He was one of nine children born to his parents. He lived the frugal life of the New England farmer at the close of the Revolution during his boyhood.

He received his early education at a private school at Lebanon, which probably did not rank any higher than the surrounding public schools of that time. Having reached his majority during the unsettled and changing times from 1785 to 1806 and having already shown symptoms of a restless ambition, it was natural that tilling of the soil and churchgoing were not entirely to his liking. He became restive, awaiting only the time when he could depart from his paternal roof as his own lord and master.

He left his father's home in the winter of 1806-7 with an outfit consisting of a horse and cutter, a barrel of cider, and one hundred dollars of hard earned money. Traveling north through the western part of Massachusetts and Vermont, he arrived in the spring at the little village of Champlain, on the Canadian frontier. For three years he taught school, at the same time reading medical works which he obtained from the library of Dr. Pomeroy of Burlington, Vermont.

In the fall of 1810 he went to St. Albans, Vermont, where Dr. Benjamin Chandler was the most prominent and capable practitioner. He was taken into Dr. Chandler's home as an apprentice with his own son John, who was reading medicine with his father. Two years later he was granted a license to practice by the "Third Medical Society of the State of Vermont."

September 13, 1812, he was received into the Army at Plattsburg, New York, as surgeon's mate, and was commissioned December 2, 1812, by President Madison. He took part in several engagements, the last being the battle of Plattsburg. In the latter part of 1815 he resigned from the army and entered private practice at Plattsburg, New York. In connection with his practice he conducted a drug and grocery store.

In these days it is interesting to note what was regarded as groceries and therefore necessities. The Platts-

burg Republican of September 6, 1816, contained the following announcement:

"Beaumont & Wheelock have just received and offer for sale at the lowest prices a large and well-selected assortment of Groceries consisting of Maderia, Port, London Particular, and Sherry wines; Cognac and New England Rum, Pierpont Gin, Mollassas, Tea etc., etc."

He established as lucrative a practice as the community afforded at that time, but happy in professional and social ties, Beaumont was discontented. The call of the army seemed ever to be ringing in his ears.

There had recently been a complete reorganization of the Medical Corps of the army and his friend and military comrade, Dr. Joseph Lovell, had been chosen surgeon general. The new order of things rendered active service in the medical corps of the army much more attractive than it had been during the years of his previous service. He made application for readmission to the service, which promptly received favorable action. He was commissioned by President Monroe on March 18, 1820, post surgeon of the army, to take rank from December 4, 1819. He was immediately ordered to Fort Mackinac, on the northwestern frontier. Here he performed the usual duties incumbent on a post surgeon. About one year later he went back to Plattsburg and was married, bringing his bride back to Fort Mackinac.

We now come to the incident which gave occasion for Dr. Beaumont to demonstrate his skill, thoroughness and originality. Early in June, 1822, an accident happened to one of the employees of the American Fur Company.

A group of men had gathered in the Company Store. A shotgun was accidentally discharged by one of these men, the contents hitting Alexis St. Martin in the stomach. Beaumont's own version of the accident was summed up in the following statement:

"Being then stationed at the garrison on that island and no surgeon within 300 miles, I was immediately called to his relief, and when I arrived at this place, 15 or 20 minutes after the accident, found him senseless and apparently in a moribund state. To endeavor to resuscitate and relieve his sufferings being the first impulse, I applied the best means in my power and took the responsibility of his surgical treatment and medical attendance."

The hospital records and bedside notes extending over a period of two years are a model of thoroughness and completeness that would be a credit to our modern day hospitals. I will quote a few extracts to give you a clear conception of the character of the case.

"Alex St. Martin, a Canadian lad about 19 years old, hardy, robust and healthy, was accidentally shot by the unlucky discharge of a gun on the 6th of June, 1822. The whole charge, consisting of powder and duck shot, was received in the left side at not more than 2 or 3 feet distance from the muzzle of the piece in a posterior direction, obliquely forwards and outwards, carrying away by its force the integuments more than the size of the palm of a man's hand; blowing off and fracturing the 6th rib from about the middle anteriorly, fracturing the 5th rib, rupturing the lower portion of the left lobe of the lungs and lacerating the stomach by a spicule of the rib that was blown through its coat lodging the charge, wadding, fire in among the fractured ribs and lacerating muscles and integuments, and burning the clothing and flesh to a crisp. I was called to him immediately after the accident. Found a portion of the lungs as large as a turkey's egg protruding through the external wound, lacerated and burnt, and below this another protrusion resembling a portion of the stomach, what at first view I could not believe possible to be that organ in that situation, with the subject surviving, but on closer examination I found it to be actually the stomach, with a puncture in the protruding portion, large enough to receive my forefinger, and through which a portion of his food that he had taken for breakfast had come out and lodged among his apparel. In this dilemma I considered any attempt to save his life entirely useless. But as I had ever considered it a duty to use every means in my power to preserve life when called to administer relief, I proceeded to cleanse the wound and give it a superficial dressing, not believing it possible for him to survive twenty minutes.

In attempting to reduce the protruding portion, I found the lung was prevented from returning by the sharp point of the fractured rib, over which its membrane had caught fast, but by raising up the lung with the front of the forefinger of my left hand I clipped off with my penknife in my right hand, the sharp point of the rib which enabled me to return the lung into the cavity

of the thorax, but could not retain it there, on the least efforts of the patient to cough which were frequent." * * *

"A lucky and perhaps the only circumstance to which his miraculous survival can be attributed was the protruding portion of the stomach instead of falling back into the cavity of the abdomen to its position adhered by the first intention to the intercostal muscles, and by that means retained the orifice in the wounded stomach in contact with the external wound, and afforded a free passage out and a fair opportunity to apply the dressings." * * *

"It is now going on the 7th month since the injury was received and the orifice of the stomach is still visible and but little contracted. The integuments are all cicatrized smooth to within the circumference of a half eagle immediately around the wound in the stomach. His health daily improving, his spirits good, his appetite regular, his sleep refreshing and all the functions of the system natural and healthy."

The county having refused any further assistance to the patient, who had become a pauper, Beaumont took him into his own family, providing for all his necessities. As the salary of an assistant surgeon at that time was $40 a month, with two to four rations daily, and with a family to support, this was a considerable added burden.

There can be no doubt after a careful perusal of St. Martin's case history that every possible effort was made to close the wound completely. The idea of carrying on a series of experiments on the stomach of St. Martin seems not to have occurred to him until early in 1825, just prior to his leaving Mackinac.

A series of experiments on digestion were conducted by Dr. Beaumont and published in the Medical Recorder. He noted the length of time required for the digestion of various articles of food suspended in the stomach by a silk string which he could introduce and withdraw at pleasure, thus noting the changes in these substances from time to time. Even these incomplete experiments assured him that the old theories of maceration and putrefaction were insufficient to explain the processes that he had observed, and that the gastric secretion possessed innate solvent powers.

At this time Dr. Beaumont took leave, taking St. Maritn with him. While on this trip St. Martin took French leave and, in spite of repeated efforts to get him back again, it was about four years before he returned to Dr. Beaumont.

Now that his dream was again realized, Dr. Beaumont lost no time in beginning anew his experiments on the stomach of St. Martin. With no laboratory equipment but a thermometer, a few open mouth vials, and a sand bath, he conducted at this isolated military post (Ft. Crawford) a series of observations on digestion which have not been excelled even under more favorable conditions and surroundings. Between December 6, 1829, and April 9, 1831, there were recorded fifty-six experiments. Later another series of 116 experiments were recorded.

The results of these experiments were finally published by Dr. Beaumont in a book of 280 pages, entitled "Experiments and Observations on the Gastric Juice and the Physiology of Digestion." In all 238 experiments were conducted and recorded. Up to this time the status of our knowledge of the processes of digestion were very meagre and for the most part erroneous. A comparison of Beaumont's deductions with those of the most recent workers on the physiology of digestion shows that he anticipated some of their best results, notably the researches of Pavlow on the work of the digestive glands, Cannon on the mechanics of digestion, and others.

In the words of Vaughn, "he made such an exact study of the physical and chemical natures of the gastric juice that with the exception of the discovery of pepsin, the closest research of modern times has added but little to the work done by him."

His book was very well received, but naturally had a very limited circulation. The financial returns were disappointing and were far from covering the extra expense he had incurred for the support of St. Martin and his family.

In the fall of 1834 Dr. Beaumont was ordered to the arsenal at St. Louis for permanent station. In the meantime St. Martin had gone to Canada again and all efforts to induce him to return to Dr. Beaumont had failed. This was a great disappointment to Dr. Beaumont, as he wished to continue his experiments.

Private practice by the army surgeons at that time was encouraged by the Surgeon General. He opened an office in St. Louis and, due to his established reputation, strong personality, and splendid presence, private practice fell into his hands very quickly. Within one year he had established a practice with an income of $8,000 per year. His standing in the profession is shown by the offer of the chair of surgery in the first medical department established west of the Mississippi.

The new Surgeon General, Thomas Lawson, had been appointed in 1836. It seems that considerable jealousy existed between him and Dr. Beaumont. It was customary at that time for the older officers of the Medical Department to choose their permanent stations and not be disturbed thereafter, so that when in 1839 an order was issued for Surgeon Beaumont to proceed to Florida on an examining board, he tendered his conditional resignation, providing the department still insisted on his going to Florida. No change was made in the order, so, on January 20, 1840, Surgeon William Beaumont's resignation was accepted. He later attempted to have this resignation set aside, but was unsuccessful. His opinion of Surgeon General Lawson is expressed in a letter to another medical officer, an extract of which reads:

"Congratulating myself upon having escaped service under the present Chief of the Medical Department, I sincerely commiserate my associates in the Army who remain subject to his caprice and tyranny, the natural fruits of ignorance and vanity."

Thus was terminated his brilliant military career of more than twenty-five years. It seems sad indeed that his services should have been so abruptly and unsatisfactorily brought to a close. Even today his brilliant work is pointed to with pride by the officers of the Medical Corps of the Army. Surgeon General Torney in an address before the Philadelphia Medical Club cited Dr. Beaumont's work as the first great scientific achievement of a member of the Medical Staff.

Dr. Beaumont enjoyed a very extensive and lucrative practice in St. Louis until the time of his death in 1853. During all of this time he had endeavored to regain possession of St. Martin, but in spite of his desperate poverty, he would always put him off, so that Beaumont never saw him again after 1834. St. Martin lived to be 83 years of age and died June 24, 1880.

Dr. Beaumont lies buried in beautiful Bellefontaine Cemetery in the city of St. Louis, with a modest marble slab to mark his resting place. Few are the pilgrimages to his grave, and few there are who even know where lie the remains of this unique and remarkable man; yet all mankind has profited by virtue of his having lived and worked. Dr. Osler said of him, "The pioneer physiologist of the United States and the first to make a contribution of enduring value, his work remains a model of patient, persevering research."

His memorial, although belated, lies at the foot of Mount Franklin, the William Beaumont General Hospital.

GENERAL GEORGE MILLER STERNBERG

By MAJOR F. E. GESSNER.

It is difficult to consolidate into a few pages the broad achievements of General Sternberg. During his life he attained renown not only as a medical officer who rose to the highest honor of the Medical Corps of

the U. S. Army, but also as a scientist, as a philanthropist, as an author and as a broad minded citizen.

George Miller Sternberg was born at Hartwick Seminary, Otsego County, N. Y., June 8, 1838, and died in Washington, D. C., Nov. 3, 1915, at the age of 77 years. He was descended from one of the early German settlers of New York State. He spent his boyhood and received his early education at Hartwick Seminary, where his father was principal. At the age of 16 years he became self-supporting by teaching school in the vicinity of his home. He began the study of medicine at the age of 19 years, under the preceptorship of Dr. Horace Lathrope at Cooperstown, N. Y., and received the degree of doctor of medicine with the class of 1860 at the College of Physicians and Surgeons of New York. After graduating in medicine he practiced his profession in Elizabeth, N. J., until the outbreak of the Civil War.

In the year 1861, with the outbreak of the Civil War, Sternberg was appointed Assistant Surgeon, U. S. Army, after due examination. During the war he served in the Battle of Bull Run, where he was captured by the enemy and later made his escape after the expiration of his parole. He also served in the engagements at Gaines Mill, Turkey Ridge and Malvern Hill. Even during the early days of his career he showed exceptional ability and courage and received a brevet for meritorious service.

Following the war, Sternberg served at Fort Harker, Kansas, and encountered a severe epidemic of cholera in 1867. During this epidemic he lost his first wife. In 1871 he was Post Surgeon at Ft. Columbus during the yellow fever epidemic. It is probable that the impressions made by the ravages of these diseases had much to do with deciding his subsequent medical activities. As a result of his experience, careful observation and accurate reports of yellow fever at Ft. Columbus, he was detailed for duty in 1872 to New Orleans and Ft. Barrancas in the so-called yellow fever zone. He observed two epidemics of yellow fever at Ft. Barrancas during this time, and during the second epidemic suffered a severe attack himself, with many complications. His first publication of scientific value related to the clinical history of yellow fever as observed by him during these epidemics.

In 1876 Sternberg was ordered to the Pacific Coast for duty, and during this tour was engaged in the active campaigns against the Indians. During these campaigns he distinguished himself for gallant service in the performance of duty under fire at the battle of Clear Water, Idaho, and received a brevet Lieutenant Colonel in recognition of his service.

As a representative of the Medical Corps of the Army, Sternberg attended the meeting of the American Public Health Association in the fall of 1878 and on his return from this meeting he began his experiments to determine the practical value of commercial disinfectants which, until that time, had been used empirically. This work he continued in Washington and the laboratories of the Johns Hopkins University under the auspices of the American Public Health Association. This meant daily and exacting application over a period of years under conditions far from ideal in the light of our present knowledge. He won for himself, however, the Lomb prize in 1886 and in 1888 the results of his work were published in full in the Transactions of the American Public Health Association. This work alone meant much in the battle against infectious diseases. Sternberg revised the work in 1899 and it was translated into several foreign languages, and our present practical methods of disinfection are largely based on the result of this work, together with that of Koch. At that time, the accurate and logical methods of Koch were not available to laboratory workers in America, and Sternberg was the only worker in pure bacteriology. Only those familiar with the exacting methods of serious bacteriological research, con-

ducted by the immature methods of that time, can appreciate the magnitude of this work on disinfectants.

Coincident with his studies of disinfectants, Sternberg carried on researches in other fields of bacteriology. In 1880 he discovered a micrococcus in his own saliva, and that of other normal individuals, to which he gave the name Micrococcus Pasteuri. This organism, when introduced into the tissues of laboratory animals, produced a fatal septicemia. Later, in 1885, he discovered the fact that his micrococcus of sputum septicemia was identical with the capsulated micrococcus of rusty sputum of pneumonia described by Frankel. While it has fallen to the lot of Frankel to share the credit of this important discovery, there is no question that Sternberg first recognized and described the organism, although he did not associate it with pneumonia in his first publication.

In 1881 Sternberg proved conclusively that the so-called Bacillus Malariae of Klebs and Tommasi Crudelli, then attracting wide attention, had nothing to do with the causation of malaria. In 1885 he demonstrated for the first time in this country living motile Plasmodia Malariae, first seen by Laveran in 1880, and subsequently proved to be the cause of malarial fever.

Sternberg was also the first to suggest the role of leucocytes as defenders of the body against pathogenic bacteria. In one of his publications, in 1881, he suggested that the disappearance of bacteria from the circulation, observed in some of his experiments, "may be effected by the white corpuscles, which it is proven pick up after the manner of amoebae, any particles, organic or inorganic, which come in their way, and it requires no great stretch of credibility to believe that, like amoebae, they may digest and assimilate the protoplasm of the captured bacterium, thus putting an end to the possibility of its doing any harm." This explanation is commonly spoken of as Metschnikoff's Theory, since he has been one of its chief defenders as a theory of immunity, but it was clearly stated by Sternberg several years before Metschnikoff's first paper was published in 1884.

The tubercle bacillus described by Koch in 1881 was demonstrated and photographed by Sternberg the first time in this country in the same year. He also introduced the typhoid bacillus to the medical profession of this country in 1886 in a paper read before the Association of American Physicians.

Of the many and varied problems with which Sternberg was identified, probably none absorbed more of his energies than his investigations of yellow fever, which date back to 1871. In 1879 he began his search for the specific organism, while a member of the Havana Yellow Fever Commission, which lasted over a period of ten years. As a result of his work and the results of those working under him, the history of yellow fever was complete except for the discovery of the causative organism, leptospira icheroides, which fell to the lot of Noguchi. He was twice sent to Havana during the months of yellow fever prevalence, and to Rio de Janeiro and Vera Cruz to continue his investigations, and to the town of Decatur, Ala., during the yellow fever epidemic of 1888. His report of these extended investigations showed that researches to that date failed to demonstrate the specific cause of yellow fever, that the claims of Domingo Friere to have discovered the germ of the disease, his Crytrococcus Xanthogeniccus, and his method of producing immunity had no scientific foundation; that the bacillus of Gibier and the micrococcus tetragenus of Finlay and the microorganism encountered by himself and by other investigators bore no etiological relation to the disease. It speaks well of his work that even after it was known that the infective agent was transmitted through the bite of a mosquito it was not until years after that the true causative organism was found. It was believed that the spe-

cific cause was ultra-microscopic. Having exhausted all resources at his command, in search of the specific cause of yellow fever, by microscopical examination of blood and tissue, by cultural methods and by experiments on animals, he felt that direct experimentation on man was the only method left offering any promise of success. This line of work appears to have been pointed out to Major Walter Reed in 1900 when appointed chairman of the Yellow Fever Commission.

Having been appointed Surgeon General of the Army in 1893, General Sternberg was not able to personally continue his investigation of yellow fever, but he had interested other officers of the Corps, who continued the work more or less under his direction. In 1900 he organized the Yellow Fever Commission, of which Major Walter Reed was chairman, shortly after Sanarelli claimed to have demonstrated the bacillus icteroides as the specific cause of yellow fever and his work had been confirmed by two officers of the Public Health and Marine Hospital Service. Major Reed's investigations resulted in demonstrating that in yellow fever the specific infectious agent is present in the blood of the patient and that the usual and probably only method of transmission of the disease is through the bites of the stegomyia mosquito. This demonstration furnished the basis for preventive measures of incalculable value to mankind, which permitted the building of the Panama Canal and which has almost wiped yellow fever from the face of the earth today. Although General Sternberg did not take part in these experiments, he appointed the commission, suggested much of its work, and much of the success achieved was rendered possible by the preliminary work of General Sternberg, which had eliminated numerous errors and overthrown many erroneous claims for the discovery of the specific organism.

General Sternberg was the Surgeon General of the U. S. Army from 1893 to 1902, and as such did much to improve the efficiency of the Medical Corps. Even today the effects of his efforts are felt and many of his results stand as monuments to a man of great achievement and foresight, who fostered and inculcated a scientific spirit in his corps. He established the Army Medical School, which has become indispensable to the Medical Corps, and which has only lately been consolidated with the Walter Reed General Hospital, and at some later date the Army Medical Museum and Surgeon General's Library will be combined with it to form the greatest medical center in the world. He established laboratories for scientific investigation at most of the important army posts, provided modern operating rooms and encouraged their use by surgeons in the service; and established the tuberculosis hospital at Ft. Bayard, N. M., which has recently been turned over to the Veterans' Bureau for the treatment of veterans of the late war.

During the Spanish-American War, General Sternberg met all the increased demands upon his corps with efficiency in the face of legislative embarrassment and administrative obstacles, establishing a corps of female nurses for service in permanent hospitals, increasing the medical staff by officers selected from the Association of Military Surgeons, and afterwards supervising the organization of medical service in our tropical possessions. Four days after the declaration of war with Spain, General Sternberg issued instructions to all medical officers (Circ. I, S. G. O., April 25, 1898), calling attention to the dangers of infectious diseases, particularly malaria, typhoid fever, diarrhea, dysentery and yellow fever, and making recommendations for prevention of these diseases. The instructions in this circular are very complete, covering care of camp sites, latrines, kitchens, water, excretions of patients, etc., and even mentions at considerable length the probable method of typhoid and diarrheal diseases being transmitted through the

agency of flies. A noted sanitarian, in addressing the Medical Society of the District of Columbia in October, 1898, said: "Had the lessons of the Civil War and the note of warning sounded by Surgeon General Sternberg in his famous circular of April 25, 1893, four days after the declaration of the Spanish-American War, made a deeper impression upon our volunteer officers, the disgraceful insanitary conditions and dire consequences would not have been observed."

During the Spanish-American War he organized eight army hospitals at appropriate places, and equipped two hospital ships and one hospital train. He organized the female nursing corps, previously mentioned, which has become an indispensable part of our army, and the dental corps, which was so greatly needed. Both of these corps were organized in accordance with an act of Congress, passed on his recommendation.

General Sternberg was retired from the army in 1902, having reached the age limit for active duty, but he continued his duties as a citizen. He was affiliated with many organizations, in a conspicuous way, having to do with the welfare of Washington, D. C. He was president of two companies dealing with improvement of housing conditions in Washington, director and member of many hospital and tuberculosis committees, Professor of Preventive Medicine in George Washington University, member of all important medical societies, Fellow of American College of Surgeons, ex-president of American Medical Association, American Public Health Association, Association of Military Surgeons, and honorary member of many foreign medical societies.

General Sternberg was what might be called a self-made man. His early environment was not luxurious; a school teacher at sixteen; a student of medicine on borrowed money at nineteen, all of which money he afterwards returned; a surgeon in the U. S. Army at twenty-three—speaks for individual capacity that bade well to carry its possessor far in the race of preferment—as his subsequent history has well shown to have been the case.

WILLIAM CRAWFORD GORGAS

By LT. COL. M. A. W. SHOCKLEY, M. C.

William Crawford Gorgas was born in Mobile, Alabama, on October 3, 1854. He was the son of General Josiah Gorgas, of Hispano-Dutch ancestry, who was the chief of ordnance of the Southern Confederacy during the Civil War, and later the president of the University of the South, at Sewanee, Tennessee. His mother was Amelia (Gayle) Gorgas, daughter of Governor Gayle of Alabama.

General Gorgas was graduated from the University of the South with the degree of A. B. in 1875, and from Bellevue Hospital Medical College with the degree of M. D. in 1879. He entered the Medical Department of the United States Army on June 16, 1880, as first lieutenant, was advanced to captain in 1885, and to major in 1898.

In 1880 yellow fever was prevalent in Brownsville, Texas, in violent epidemic form. Conditions were bad beyond the power of words to portray to those who have no recollection of conditions in a yellow fever stricken city prior to 1880. The government as well as the people at large had been appealed to.

Gorgas, with the rank of lieutenant, was sent to Fort Brown, near Brownsville, to assist in the medical care of the civilian population. There he first met Miss Marie Cook Doughty, who was seriously ill of yellow fever, and there he also contracted the disease. He married Miss Doughty in Cincinnati on September 15, 1885.

Later, General Gorgas was in active service in Florida, in the west,

in the Dakotas, and in the old Indian Territory. He accompanied the military expedition against Santiago in 1898. While on duty before Santiago, General Gorgas was in charge of the field hospital for febrile diseases, some of which were yellow fever. He had many interesting, amusing and pathetic reminiscences of this service. Fate, possibly with a purpose, visited his system with yellow fever in early life, thereby making him immune to the disease. Because of his practical knowledge of yellow fever transmission, he was appointed chief sanitary officer of Havana, which post he occupied from 1898 to 1902.

During General Gorgas' tour as Sanitary Officer at Havana, I had the pleasure, in company with Colonel Theodore Lyster, now retired, of serving as his assistant. During this service General Gorgas, Lyster and myself lived in adjoining apartments in the old Maestranza, in which we had our offices. The constant association that we had personally and officially with this most charming officer made this for me the most instructive and delightful duty tour I have ever had.

In 1900 General Gorgas, as Sanitary Officer, was in close contact with the investigation into the cause of yellow fever that was being conducted in Havana by the Walter Reed Board. The memorable discovery made by this board revealed the cause of the disease; but it was General Gorgas who applied these principles and effected the eradication of yellow fever from Havana.

You will remember that Major Reed had constructed, in an open field some distance from Havana, two thoroughly screened huts, in one of which he maintained mosquitos, supposedly infected; in the other (mosquito free) he had non-immunes live among bedding and materials soiled by yellow fever cases. On an occasion early in the investigation, General Gorgas, Lyster and myself, all of us known to have had yellow fever, were invited as a pleasantry to occupy the mosquito house, but we all declined on the plea that as we were immunes the experiment would be useless, and as we were constantly exposed elsewhere, no proof of infection in the house could be secured.

In 1904 General Gorgas was appointed chief sanitary officer of the Panama Canal Zone, and in 1907 he was made a member of the Isthmian Canal Commission. In recognition of his work in Havana, his rank was increased to that of colonel by a special act of Congress in 1903, and he became Assistant Surgeon General of the United States Army. In 1915 General Gorgas and his associates on the Isthmian Canal Commission received a vote of thanks from Congress for distinguished service rendered in connection with the construction of the Panama Canal. This is one of the few instances in history where sanitary achievement has been recognized by the state since Hippocrates was awarded a civic crown by the citizens of Athens for averting a pestilence from that city. This reflects much credit on our national legislature as well as on Gorgas, for republics are usually unappreciative of the quiet conquests of science.

In 1913 General Gorgas went to Rhodesia, South Africa, at the invitation of the Chamber of Mines, Johannesburg, to advise as to the best means of preventing pneumonia and malaria among the native mine workers. He was appointed Surgeon General of the United States Army, with the rank of Brigadier General, on January 16, 1914, and was promoted to Major General in 1915. He served with great distinction as Surgeon General during the trying period of our participation in the World War, until his retirement, at the age of sixty-five, on October 4, 1918.

He never lost his interest in world sanitation. While he was stationed in the Canal Zone he visited Guayaquil, Ecuador, and mapped out a plan for the control of yellow fever in that disease-ridden district. In 1916 he was made chief of the special Yellow Fever Commission of the Rockefeller

Foundation, and spent several months in South America making surveys and laying plans for the eradication of yellow fever from localities in which it still prevailed.

After his retirement as Surgeon General, he immediately accepted the assignment to direct the yellow fever work which had been undertaken by the International Health Board of the Rockefeller Foundation. On May 7, 1920, he sailed for England, en route to West Africa, where he was to investigate the yellow fever situation. He fell ill in London on May 30, 1920, and died on July 4, 1920.

At the death of General Gorgas humanity lost a mighty genius and a noble friend.

Simple in character and habits, gentle, kindly, just and considerate in every way, he was an exemplar of the ideal of an American gentleman. Always a friend and never an enemy, he was nevertheless an indefatigable opponent of any person who persisted in a wrong, and never quit a conflict until the wrong was righted or the opponent defeated.

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GANGRENOUS TYPE OF POSTOPERATIVE PNEUMONIA

WILLIS S. LEMON, M. D., and ARTHUR E. MAHLE, M. D., Division of Medicine, Mayo Clinic, Rochester, Minnesota.

Gangrenous pneumonia is only one of several types of postoperative pulmonary complications, but its character is so serious that it adds materially to the mortality percentages in any institution in which large numbers of operations are performed. The two great causes of death in such institutions are primary sepsis and secondray pulmonary complication. Sepsis will not be considered here except as it relates directly to the pulmonary complications. How important a role pulmonary complications in general may play, is best illustrated by reference to statistics gathered from foreign and American institutions. These indicate that sickness and death occur with such regularity that their incidence can readily be foretold; their relative frequency seems to be almost uniform in all large and well conducted institutions. It is to be expected that one in fifty patients operated on will develop some type of pulmonary complication, and that one in 185 will die from it. Deaths due to pneumonia alone, following operations of all types, are approximately 0.5 of 1 per cent, while the morbidity percentages are approximately 1.12 for general surgery, and 4.4 for laparotomies. Homans reports approximately 5 per cent from 16,043 laparotomies. Cutler and Hunt point out that a higher incidence of complications occurs when operative fields cannot be kept at rest. They assert that 2 per cent of all patients operated on, 4 per cent of all patients who have abdominal operations, and 8 per cent of all patients who have epigastric operations, develop pulmonary complications. McKesson made observations on postoperative lung complications, and combined statistics in 39,438 cases, in which the pulmonary morbidity was

(*Read before the New Mexico State Medical Society, Santa Fe, May 28, 1924.)

3.03 per cent, and the mortality 1.06 per cent. These are data that can be verified, at least approximately, in any hospital in which large numbers of such patients are under observation.

In 1910, Beckman reported on 3,657 operations from the Mayo Clinic, in which there was a pulmonary morbidity of 0.01 per cent (thirty-seven cases) and a mortality percentage of morbidity of 16 (six cases). In 1912, his report covered 5,835 operations with a morbidity of 0.015 per cent (eighty-nine cases) and a drop in the mortality percentage of morbidity to 7 (six cases), while in 1913, his report covered the results of 6,825 operations with a morbidity of 0.012 per cent (eighty-seven cases) and no mortality. This is the only statistical report of its kind in regard to mortality. The percentage of morbidity compares favorably with that of Ranzi of von Eiselberg's Clinic, who had an incidence of 3.8 per cent following 6,871 operations, and of von Lichtenberg, whose incidence was 1.9 per cent following 23,673 operations. In this country Armstrong had an incidence of 2.2 per cent following 2,500 operations with a mortality percentage of morbidity of 58.1, and Cutler and Morton reported on 3,490 cases with an incidence of 1.86 per cent and a mortality percentage of morbidity of 50.7. In 1920 Cutler and Hunt reported 1,562 cases from the same institution (Peter Bent Brigham Hospital) with a morbidity of 3.52 per cent, and a mortality percentage of morbidity of 20. A year later they reported 1,604 cases with a morbidity of 3.92 per cent, and a mortality percentage of morbidity that had fallen to 7.93.

For the three years reported by Beckman, there were 16.317 cases; fifteen of the patients (one in 1087) had died. In 1922, at St. Mary's Hospital (Mayo Clinic), 9,075 operations were performed, of which 5,661 were abdominal. The total mortality was 1.9 per cent, and the mortality for abdominal operations 2.8 per cent. Of the 164 patients who died, thirty-five were known to have pneumonia of various forms and degrees of severity. It was sufficiently serious to be considered the cause of eight deaths, a definite contributing cause of thirteen, and a terminal cause of fourteen. Twenty-four patients had bronchopneumonia, two had lobar pneumonia, one had embolic pneumonia, and eight had gangrenous pneumonia.

Instead of an anatomic classification, an etiologic one would be more instructive from the standpoint of the surgeon. The knowledge of the cause of the complication would suggest ways and means for prevention. Certainly any disease than can be foreseen should submit to treatment or prevention. The types of pneumonia seen in the Mayo Clinic may be divided as follows:

1. **The embolic type**—This type of pneumonia comes on suddenly, usually several days after operation, and is associated with bright red blood in the sputum, following the initial pleuritic pain. Stripped of the infective elements, from whatever source, such lesions usually appear and subside rapidly. They are small, circumscribed and lobular, rather than lobar, usually affect the lower lobe of the right lung, and are especially common following operations on the upper abdomen, especially on the stomach, and are serious only when they add to the load already being carried by a very sick patient whose reserve has already been taxed by an operation that in itself was a grave risk.

Because of the onset with pain, the persistence of pain, the lobular distribution throughout the lower lobes, and the cone-shaped x-ray shadow, Cutler and Hunt sponsor the embolic theory to explain postoperative pneumonia. They note the well recognized infrequency of lobar pneumonia, and believe it is due to the mechanism of production of the pulmonary lesion. They think this is another proof of the embolic origin of the complication.

2. **Auto-infection type** — The fact that one so infrequently finds necropsy evidence of thrombosis in cases of postoperative pneumonia, that the classical picture of embolic pneumonia is infrequently seen by the pathologist, and that the bacteriology is of the respiratory tract, suggest another mechanism, auto-infection. The two may interact, as has been shown. A lesion may form and be truly embolic in character. The infective factor may readily be present and prepared to change an infarct into pneumonia. The patient, when weakened by disease or the shock of operation, is infected by bacteria of which he himself is the healthy carrier. This type usually appears suddenly, within twenty-four to forty-eight hours after operation, without chill, but with a sharp rise in temperature, and frequently with moderate pleuritic pain. The temperature falls within the third to the fourth day by lysis, and the yellow mucopurulent sputum contains Group 4 pneumococcus. This is the form described by Whipple and Cleveland. Like them, we have found Group 4 pneumococcus almost always present, although recently the sputum from an extremely ill patient was found to contain Group 1 organisms.

3. **Epidemic pneumonia** — In the third type, that due to epidemic pneumonia, the patient operated on may obtain his infection through the air passages by breathing bacteria from persons who are infected by the specific organism. Such patients are susceptible to infection, as are patients outside the hospital, and an appreciable rise in incidence percentage is always noticed during epidemics; the organisms found belong to the group that prevails as the etiologic or inciting factor, increasing in virulence as they pass from patient to patient. It is in this type that organisms of Group 1, 2, or 3 are found on grouping the sputum, and the mortality varies with the severity of the epidemic.

4. **Terminal pneumonias**—The terminal pneumonias appear especially in debilitated patients suffering from chronic cardiac insufficiency, malignancy, nephritis, diabetes, and so forth, or in moribund states following operations. They present neither signs nor symptoms, the former because the patient's condition is such that diligent search is not desirable, and the latter because respiratory symptoms are overshadowed by those of dissolution. It is a type of pneumonia that is of interest as a pathologic condition, but not otherwise to the surgeon or physician because, though often anticipated, it does not respond to treatment.

5. **Aspiration pneumonias** — As I have mentioned, embolism is undoubtedly an important factor in the causation of pleurisy or pneumonia, very probably more important than has been suspected. Back of it, however, unobserved, is the circulatory defect, the weakened heart muscle, and the slowed stream, so commonly observed in the middle aged and the debilitated patient, and making the production of thrombi around the pelvic veins possible. We agree with Whipple that Group 4 is the most common type of pneumococcus found in the so-called ether pneumonias, which are, of course, really not ether pneumonias at all. The disease appears with equal regularity, regardless of the anesthetic or the anesthetists; (there were ten experienced anesthetists in the cases in the 1922 study). There were fewer instances of pulmonary infection among patients under local anesthesia, but there were fewer patients so treated; relatively the difference is insignificant when cases of equal severity and operative risk are compared. In less well-trained hands, however, the anesthetic is of decided danger. Irritation of the bronchi occurs and a descending infection of the respiratory tract results. These dangers are accentuated when the patients on the one hand are ill of debilitating disease of long standing, weakened sease of long standing, weakened from hemorrhage or the toxic effect of more acute illness, or reduced in vitality by the very nature or dura-

tion of the operation performed. On the other hand, when local anesthesia is used, in cases of throat operations, the danger, it would seem to us, is materially increased if the pharyngeal and cough reflexes are deadened.

FACTS DERIVED FROM EXPERIMENTAL WORK ON ANESTHESIA

Holscher believed that ether could not be blamed for all postoperative lung diseases, but felt sure that it had a greater influence in their production than other anesthetics. He quotes Norwert who says that the aspiration from the mouth during anesthesia is an important basis for lung infection, and that a paralysis of the soft palate, base of tongue and epiglottis occurs, so that mucus flows into the respiratory canal. This is aspirated into the depths of the respiratory tract and is the cause for respiratory infections. Holscher believed, however, that poor technic was more blameworthy, and performed numerous experiments to prove his contention. As a result he concluded that: (1) ether slightly alters the secretion, but does not cause an inflammation of the tracheo-bronchial mucous membrane, (2) during ether anesthesia, tracheal rales are due to the aspiration of mouth secretion, and can be avoided by proper technic, which will permit mucus to flow from the mouth; this can be accomplished by turning the head to the side and keeping the lower jaw elevated, (3) most of the infections of the lung after ether anesthesia are due to aspiration from the mouth, (4) the action of cilia of the trachea and bronchi is not disturbed during the anesthesia, and (5) the secretion of mucus during ether anesthesia is influenced not only by local stimulation, but also in a small degree by central stimuli.

Lichtenberg quotes from many authors, and especially from the work of Holscher, with regard to the marked excretion of saliva and mucus; he is of the opinion that mucus collecting at the entrance to the larynx travels down the air passage partly by inspiration and parly by its own weight. Henle calls attention to ether anesthesia, especially in relation to the previous effect of body cooling, and Armstrong has also stressed this factor, especially in upper abdominal surgery.

Myerson found that twenty-two of 100 patients having tonsillectomy under light anesthesia retained their cough reflex, but seventy-eight did not cough during the operative procedure, although they retained the laryngeal reflex. Of these only six were free from blood and mucus in the tracheobranchial tree, whereas eighteen of the twenty-two, who had cough reflex, had no blood or mucus when examined with the bronchoscope. When lightly anesthetized, the patient coughs only in the presence of increased irritability of the respiratory tract. Myerson believes that blood mixed with mucus does not carry a sufficient stimulus to set the cough reflex in motion.

In association with Dr. Mann we anesthetized dogs and placed bismuth in their mouths, carrying on the anesthesia until the animal died from it. The head was kept in the upright position, and after death the lungs were removed, after tying off the trachea. In such dogs the bronchi contained bismuth (Figs. 1 and 2).

It may be conceded that, under ordinary conditions, conscious adults do not aspirate foreign material; moreover, ether does increase the amount of mucus collecting in the pharyngeal well. Under certain conditions, such as (1) the debility previously referred to, (2) the failure of protective reflexes, when patients are extremely ill or delirious, unconscious, intoxicated, or insane, (3) the pain of an abdominal wound, (4) the tension of bandages that are allowed to be placed too high and to cover the lower ribs and the insertion of the diaphragm, (5) the lack of movement of the diaphragm and subsequent massive, pulmonary collapse, as described by Pasteur, Briscoe, Scrimger, Bradford, Elwyn and Girsdansky, and others, (6) the circula-

tory damage from disease or age, and (7) weakness of expiratory effort preventing expulsion, so that mucus churns about, sonorous rales can be heard, dyspnea and cyanosis appear, probably with depression of the protecting nervous center, and aspiration into the bronchial tree occurs. This mechanism, a similar but much more gross aspiration than that described by Lord as productive of "ether pneumonias," accounts for the type of aspiration pneumonia we shall describe here in detail.

The work of Myerson and Holscher, and the experimental work in the Clinic have proved that mucus and blood may invade the bronchial tree in both man and animal when anesthetized for surgical reasons. Vomiting, followed by aspiration, is a second mechanism by which foreign material can be carried to the lung. It appears, not during deep anesthesia, but at the onset of unconsciousness and as consciousness returns. The nursing care at these particular stages of anesthesia should be most watchful. It is the time, however, of greatest opportunity for error and neglect, especially postoperatively, because responsibility is being transferred from anesthetist to ward tender, and again to the nurse in charge of postoperative care. The distance from the operating room to the patient's bed provides for hidden dangers, not only from the causes already mentioned but also from chilling. In some large clinics these dangers are obviated by having patients transferred directly to a large warm room adjacent to the operating suite, in which they may regain consciousness under the observation of special nurses trained to care for them; this minimizes the opportunity for postoperative complications. Constant supervision alone can protect the shocked, sweating and nauseated patient from the gravest danger in surgery. Provided a good circulation is maintained and the lungs remain uninfected, the patient has little to fear from surgical operation except sepsis, and the usual dangers incident to his disease and operation. If carelessness exists at any time from the beginning of the anesthesia to the return of consciousness, than assurance is destroyed because pulmonary complications may appear and hazard his recovery. When aspiration of infected foreign material occurs suddenly, this material can be discovered in the bronchi and bronchioles if death succeeds quickly. In instances, however, in which death supervenes late, it is with the greatest difficulty that the original infective material can be discovered, and only a hint as to its origin can be obtained by the odor of the lung, or in case of vomitus, by the yellowish discoloration in the bronchial mucosa. In only one or two instances in the Clinic was it possible to discover evidence that definitely identified the aspirated material as vomitus.

Although unconsciousness from anesthesia is so important a factor in aspiration, it is by no means essential. Patients who have had perfectly smooth general anesthesia, or those who have had local anesthesia, and indeed those who have had no anesthetic at all, may succumb to aspiration pneumonia of gangrenous type, if (1) the operation performed was conducive to formation of much mucus, and the mouth is in an unhealthy or neglected condition, providing myriads of the usual forms of bacteria and also

LEGENDS

Fig. 1 (Dog H45). An x-ray picture of the lung of an etherized dog with 20 per cent barium solution poured into its mouth, 4 c.c. every two minutes until 50 c.c. was administered.

Fig. 2 (Dog H47). An x-ray picture of the lung of an etherized dog with 35 c.c. of barium solution poured into its mouth at intervals.

Fig. 3 (Case A404586). Prolonged case of gangrenous pneumonia. Photograph of hospital chart, showing irregular temperature and pulse, with increasing respiratory rate.

Fig. 4 (Case A417181). Acute case of gangrenous pneumonia. Photograph of hospital chart, showing rapid fall in temperature with rapid rise in pulse rate.

Fig. 5 (Case A411122). Acute case of gangrenous pneumonia. Hospital chart showing rapid rise in temperature and pulse.

FIG. 1

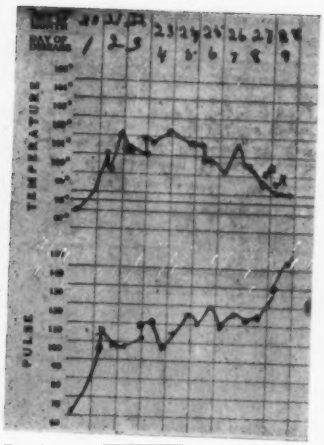

FIG. 4

FIG. 2

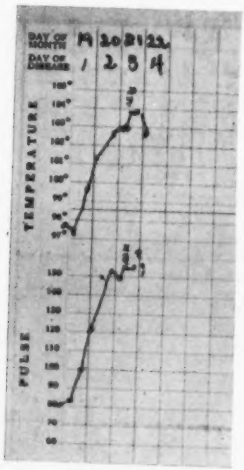

FIG. 5

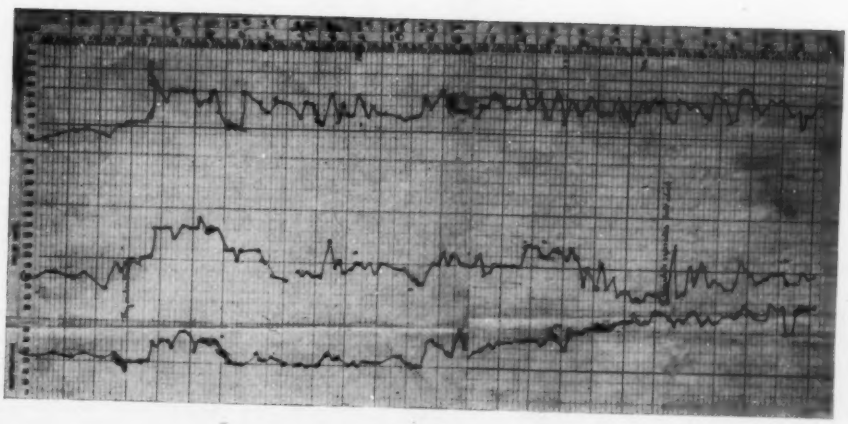

FIG. 3

FIG. 6

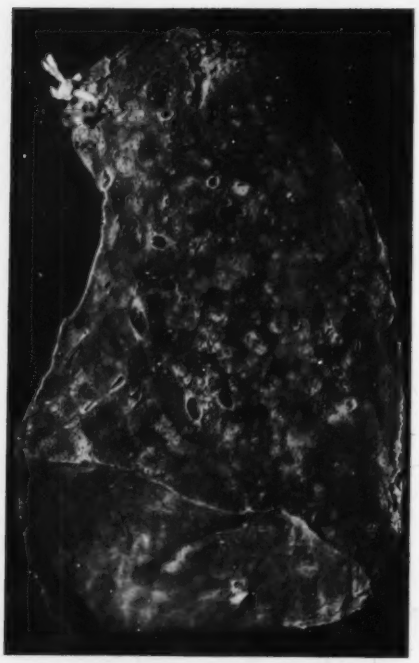

FIG 7

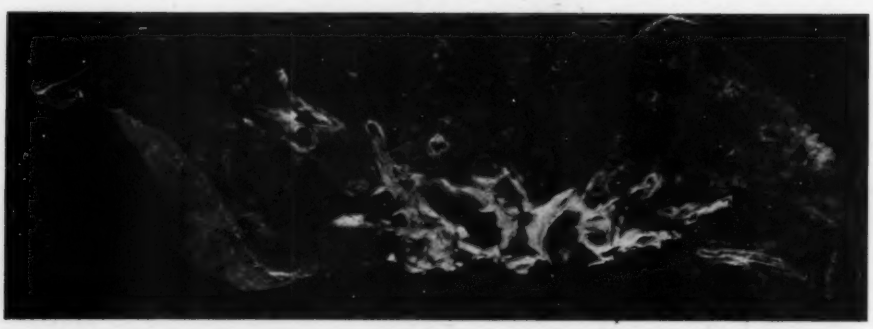

FIG. 8

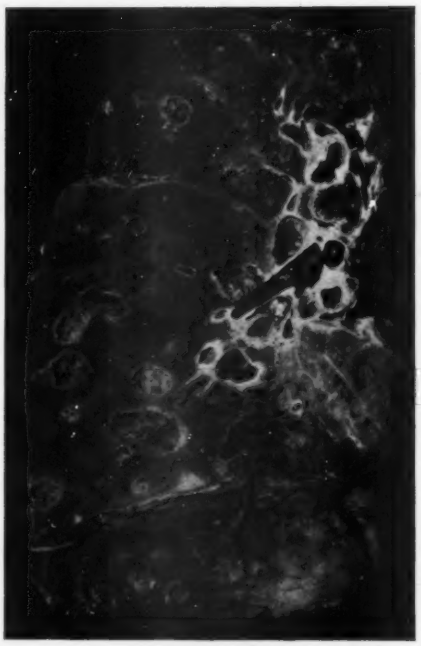

FIG. 9

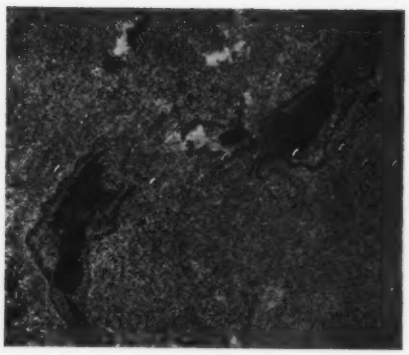

FIG. 10

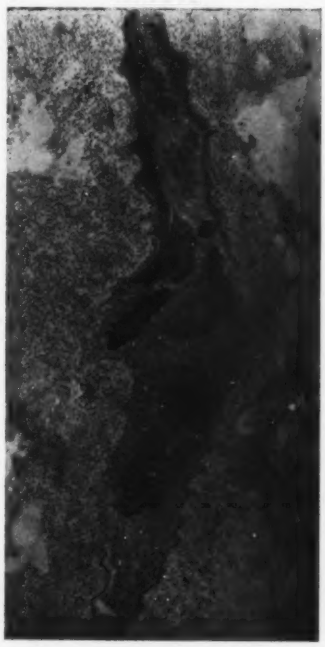

FIG. 11

LEGENDS

Fig. 6 (Case A381784). Gangrenous pneumonia with multiple abscesses involving the middle portion of the lobe.

Fig. 7 (Case A390354). Many small abscesses of the lungs surrounded by pneumonia areas. Many bronchi show dilatation of their lumina and an acute bronchitis.

Fig. 8 (Case A411122). Abscesses throughout the lung tissue with considerable necrosis and breaking down of these areas, and very little reaction in the surrounding parenchyma around these areas.

Fig. 9 (Case A425360). Relatively large abscesses throughout the parenchyma. The remaining lung tissue shows relatively little evidence of pneumonia.

Fig. 10 (Case A411122). Early gangrenous process in midst of small bronchioli. Note homogeneous stimulus cell debris. The epithelium of the bronchioli is still intact.

Fig. 11 (Case A411122). More advanced gangrenous process than Figure 10, extending into adjacent parenchyma.

Fig. 12 (Case A386051). An early stage of gangrenous pneumonia, showing karyolysis of nuclei, and the cytoplasm of the cells merged into a structureless dense mass which takes a light pink eosin stain. Note the small degree of reaction in the adjacent parenchyma.

Fig. 13 (Case A386051). An area of gangrenous pneumonia, showing a more advanced stage of necrosis than Figure 12, with area of autolysis in the midst of process. Note that the parenchyma shows more reaction than in Figure 12.

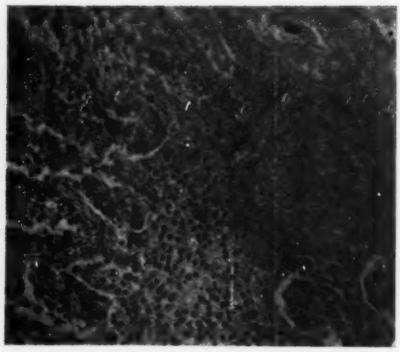

FIG. 12

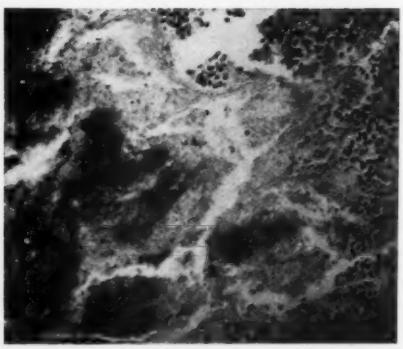

FIG. 13

saprophytes; (2) debilitation or shock has resulted from operation, and there is an inhibition of normal respiratory movements, suppression of normal impulse to cough, or weakness of expulsive power, preventing discharge of mucus from the pharynx; (3) the cardiovascular mechanism is such that the pulmonary circulation is impaired, chronic passive congestion exists and resistance to infection is decreased, or (4) the lungs are the seat of chronic infection.

We have instances of this character, of which one may be cited. Thyroidectomy was performed under local anesthesia and nitrous oxide oxygen. There were superfluous mouth secretions, and audible churning about in the pharynx. The patient was debilitated by disease and by the operation. Cardiac embarrassment, as evidenced by the onset of auricular fibrillation, occurred immediately after operation, and soon after, the lungs, which had long been the seat of chronic bronchitis, became congested, and the patient developed acute bilateral bronchiectasis associated with pneumonitis of gangrenous character. In other instances the mechanism is less clear because no technical mischance occurred, and it must be assumed that aspiration occurred during unconsciousness or semiconsciousness, and that the introduction of putrefactive bacteria set up the condition. In the majority of cases, and almost always when special care is taken to search for them, spirilla and fusiform bacilli are found in the sputum before death, and in the lungs at necropsy. One can expect them when the breath has a foul, sweetish, or musty odor. Buday considers these organisms the specific cause, and sufficient to produce necrosis and putrefaction.

Whether or not bronchoscopic removal should be considered, if the patient's strength is insufficient to raise the secretion, is an open question. It has been suggested by Jackson in other types of disease, but has not been used in the Clinic. The gravity drainage methods have been used, however, but with indifferent results.

MECHANISM OF ASPIRATION

When infective material is carried into the lung it may be in such varying amounts that the mechanism is essentially different. A patient may suddenly drown in his own secretion, or he may aspirate so little that a transient, so-called ether pneumonia, is produced, obviously a different process. Amounts insufficient to fill the bronchial system, however, may be aspirated. It may be sufficient to allow air to enter the bronchioles and distal portions of the lung, but interfere with its egress when the bronchus narrows during expiration. A stasis of secretion results, infection occurs, the lung and the bronchial wall become infected, cough from ex-

cess of secretion develops, but is ineffectual, dilatation of the bronchioles and smaller bronchi occurs, producing acute bronchiectasis and pneumonitis. Thence by extension or aspiration, the greater portion of the lung, especially throughout the lower lobes, becomes involved, putrefaction and necrosis appear, and the whole process advances so rapidly that the myriads of bacteria which fill all the spaces in the lung and destroy the tissue, may kill the patient before the usual signs of inflammatory reaction can be evidenced in the lung.

In this respect, this type of pneumonia differs from the suppurative lesions thoroughly described by Aschner, except that form classified by him as Group 1 of the suppurative pneumonitis cases. These he describes as primarily suppurative, the result of submersion and aspiration. It also differs from the gangrene of the lung described by Norris and Landis, who follow Osler's classification. There is not of necessity in these cases, the mysterious something that produces gangrene, especially among those who suffer from diabetes, or among the insane.

DISCUSSION OF MAYO CLINIC SERIES

In this study of pneumonia of gangrenous type, were included nineteen cases which have been observed clinically since 1921, and in which necropsies had been made. There were eighteen males and one female. It is not expected that this proportion is the one that will always be found, because there seems no reason why the males should be so preponderate.

Age incidence—The age of the patients seems to be of no relative importance. Five were between thirty and forty years, four between forty-one and fifty, five between fifty-one and sixty, and five between sixty-one and seventy.

Primary disease—It seemed important to inquire into the nature of the illness for which this group of patients were treated. From the knowledge that we have of the postoperative pulmonary infections, it would be expected that the majority of them would fall into the group requiring upper abdominal surgery. We were surprised, however, to find the constancy with which the upper abdomen was involved, the lower abdomen being affected in only two cases, although the appendix was removed in five. Carcinoma of the colon occurred once, and femoral hernia once. Of the diseases not definitely related to the abdomen, exophthalmic goiter treated surgically occurred twice, and nephritis was the only serious non-surgical disease.

NON-PULMONARY COMPLICATIONS AS A FACTOR IN PRODUCING GANGRENOUS PNEUMONIA

It is expected that patients of advanced years will have complications probably without symptoms, causing the greatest difficulty in evaluating the surgical risk. In this series, four patients had cardiac hypertrophy, and four had arteriosclerosis. In no instance, however, was operation performed on patients who had definite decompensation, or whose blood pressure was sufficiently high to be a menace. The gall-bladder disease of one patient was complicated by chronic pancreatitis; two patients had advanced nephritis; one, with a surgical disease, developed evidence of nephritis after operation; and the other, with a medical disease, came to the Clinic for the treatment of nephritis. One patient developed paratyphoid dysentery, and an ulcer was found at postmortem examination. These serious lesions are mentioned because they tended to remove the chance of recovery that the patients would otherwise have had, and because they caused debility which seems to be an essential factor in providing a mechanism very similar to that in anesthesia for gangrenous involvement of the lungs.

Weight — The debility brought about by the previous illnesses of the patient may be represented very graphically in this series by the weight loss. Twelve of the nineteen patients were from 9 to 25 per cent

underweight, or an average of 15.5 per cent. The weight had been lost in from one to twelve months; the average period was six and one-half months. Two of the patients had made slight gains in weight within the preceding few weeks; one was 4 per cent, and the other 5 per cent above normal. The only woman represented in the series had always been asthenic, and at operation weighed only 105 pounds. The weight of four patients was not stated.

Blood pressure—The blood pressure is one of the fundamental functions of the body, and if considered with the weight, often gives an idea of the vitality of the patient. Eight patients were found to have blood pressures of approximately 120, three of 130, two of 150, four of 160, and one as high as 190; the blood pressure of one was not stated. Patients with exophthalmic goiter or who were advanced in years had the highest blood pressure. The number of adults with blood pressures averaging below 120 suggests the debility under which many of these patients labored. The lowest blood pressure registered wsa 92 systolic and 62 diastolic; another patient had a systolic pressure of 96 and a diastolic of 60.

Anesthesia—Facts obtained from experimental work on anesthesia have been discussed[18 27] because they represent a possible mechanism by which this type of pulmonary infection might be brought about. It was important to know whether or not the anesthetic in itself could have been responsible for the cases in the series, and a survey was therefore made of the anesthetist's reports, of the type of anesthetic used, and of the length of time that the patient was under anesthesia. It was found that eleven anesthetists with long experience had given the anesthetics. Nine anesthetists gave the anesthetic to only one patient each, and one had given the anesthetic to five patients; at the end of the anesthesia, the report was satisfactory in each instance. One anesthetist had given the anesthetic to four patients and made one definitely unsatisfactory report, and one of the four had a slight degree of cyanosis. Of the nine patients, each anesthetized by a different anesthetist, one did not make a good recovery, but the condition was satisfactory during the anesthesia. There was no report of what happened while the patient was being transferred from the operating room to his bed. Two patients were reported as perspiring, and another vomited a small amount while on the operating table. The condition of all the others was reported as satisfactory. The anesthetist's report covers the amount of mucus, cyanosis, shock, vomiting ,respiration, pulse, and perspiration. If any of these is present, the anesthesia has been reported as unsatisfactory.

Ether was used eleven times, and the average amount was 6.2 oz.; the average time consumed by the operation was forty-eight and one-half minutes.

Novocain and nitrous oxid oxygen was used once over a period of forty-five minutes, and was satisfactory. Novocain and ether was used twice; in the first operation the patient was in a satisfactory condition, and in the second operation, lasting sixty-five minutes, the patient was perspiring, but otherwise the condition was satisfactory.

Novocain and nitrous oxide gas with oxygen was used once over a period of ninety minutes, with a satisfactory report.

Novocain, nitrous oxid oxygen and ether was used on one occasion for an operation lasting fifty minutes.

Novocain and nitrous oxid oxygen with ether was used in one very serious operation that lasted the longest of any in this series. The anesthesia was unsatisfactory inasmuch as the patient vomited on the table, had a slight degree of cyanosis, a pulse of 120, and respiration of 30.

Onset of gangrenous pneumonia.—If all gangrenous pneumonia is due to aspiration at the time of the anes-

thetic, it would be expected that signs should appear very early. In only two instances was the onset of pulmonary disease immediate; one of these has been previously mentioned, in which the anesthetic was given under great difficulty, and the patient had definite vomitus that could be aspirated; in the second instance the patient had had satisfactory anesthesia, but recovery was extremely unsatisfactory; there had been a great deal of mucus that could be heard churning about in the pharynx, causing embarrassment to breathing, and cyanosis. In two instances, the exact time of onset could not be ascertained; in three instances, the recovery from operation was perfectly satisfactory for as long as seven, eight, and fourteen days, respectively. It would not seem that the anesthetic in these cases could have had any bearing on the incidence of gangrenous pneumonia, but that the lack of strength and expulsive power provided for aspiration, and that the mechanism was not different from that appearing in anesthesia, coma or immersion. In the other cases, the onset was on the first day in one, the second day in six, the third day in two, and on the fourth day in two.

Earliest symptoms and signs.—In studying only one or two cases of gangrenous pneumonia, a faulty conception of the symptoms might be obtained, and for this reason the records of all nineteen cases were carefully checked. As a result, a significant clinical picture of the onset of the condition can be quite accurately drawn. There is a rather sudden onset of fever, accelerated pulse and quickened respiration. The patient appears very ill, and usually is sweating and cyanotic. Ordinarily, there is an excessive amount of mucus which can be heard rumbling in the throat; the cough is ineffectual and nonproductive, or productive of only rather small amounts of material. The breath, as a rule, has a foul odor before the odor can be detected in the mucopurulent sputum; however, the foul odor may not appear until later in the disease. The first sputum produced may be frothy and almost entirely mucoid in character. The physical examination of the patient is likely to be disappointing in the early stages, excepting that dyspnea, shock, and cyanosis may be observed. Occasionally pain in the chest will be complained of, while over the posterior lobes of the lungs a slightly decreased resonance with a few fine rales may be obtained. On the day following this primary examination, however, many more signs may be apparent, especially in the rapidly progressing cases. Among these, well developed patches of bronchopneumonia, scattered throughout the bases, have been observed as early as the second day. Usually, however, one is impressed by the fact that the signs obtained on auscultation are those of bronchitis rather than of pneumonia, with marked bubbling rales and a diminished resonance rather than actual dullness. Within the two or three days following the onset of the disease, cyanosis becomes more marked; sweating, drenching in character, frequently appears; restlessness, exhaustion and delirium become manifest, and the dyspnea becomes extremely urgent and may amount to actual respiratory distress, resembling air hunger. Hyperpnea and apnea, in periods succeeding each other, were observed in one instance, while typical Cheyne-Stokes respiration was seen frequently in patients in whom dissolution was imminent. The mucus increases in amount and changes in its character, becoming increasingly foul as its consistency alters from mucopurulent to a thin greenish or yellow, almost essentially purulent material. In two instances only was blood seen either intimately mixed with the sputum, or free. In one instance, the sputum was suddenly raised in such large amounts that a clinical diagnosis of abscess of the lung was made. Such a symptom is rare except in prolonged cases.

The temperature, pulse and respiration are shown in Figures 3, 4 and

5. It is, of course, evident that a serious outcome may be expected when the temperature falls progressively as the pulse rises, and as the respiratory difficulty increases.

On physical examination, in the more prolonged cases, the chest is seen to move rapidly with respiration, vocal fremitus is increased over certain patches, particularly in the posterior portions of the chest, or it may be entirely absent. Vocal resonance is either increased or decreased in much the same way, while percussion reveals areas of dullness that may increase to actual flatness. Dullness is similar to that found in cases of bronchopneumonia, but as time passes, may simulate that of lobar pneumonia in much the same way as do the pseudolobar forms of bronchopneumonia. On auscultation, fine rales are usually found in both sides, becoming crackling or later of coarse bubbling type. The breath sounds are similar in every way to those heard in bronchopneumonia, but occasionally they are very distant, with absent fremitus and distant vocal resonance, giving the impression that fluid is collecting within the chest. This has been, on occasion, a case for a negative finding on aspiration of the chest, and probably is the result of a filling of the bronchus, preventing air from entering that portion of the lung. Both breath and sputum are frequently very foul. The cough is a variable symptom and has been described as persistent, ineffectual, paroxysmal, occasional, continuous, very slight, or absent, and in a very exceptional instance, was so violent as to open the abdominal wound.

LABORATORY EXAMINATIONS

As one would expect in gangrenous pneumonia, there were large numbers of different bacteria, among these being staphylococcus, streptococcus in short chain, Micrococcus catarrhalis, and the pneumococcus. Fusiform bacillus and the spirilla have been found, and represent the more unusual types of bacteria. It is this type that Buday believes is responsible for the production of gangrene.

X-ray findings.—There is very little of significance in the x-ray findings except the presence of a pneumonic infiltration, and frequently of pleuritic thickening, which may simulate the presence of fluid. Evidence of dilatation of the smaller bronchi, and acute bronchiectasis, in association with pneumonia, was apparent on several x-ray plates.

Leukocytes.—The leukocyte count was variable; the highest count was 29,400, and the lowest 2,800. The average leukocyte count, however, was 11,900. A drop in the leukocyte count appeared frequently enough to be significant. In one instance, the count fell from 29,400 to 11,200 on the day preceding death; in another from 19,400 to 9,300, and in a third from 13,000 to 7,000. In only two instances was there a rise in the number of leukocytes immediately preceding the death of the patient.

Examination of the teeth.—The teeth were especially examined in thirteen cases, and in six they were in so satisfactory a condition that no notation was made. In three cases pyorrhea was very advanced, in four it was moderate, in two there were carious teeth, and in one marked gingivitis with diseased roots. We do not believe that the records regarding periapical infection are of sufficient importance in these cases to require a report. Pyorrhea, however, with the presence of pus around the gums, provides for myriads of bacteria, which, mixed with the sputum, add to the danger if aspirated into the lung.

Pathology.—The pathological picture of postoperative gangrenous pneumonia is characteristic in both the gross and microscopic aspects. A most outstanding feature is the very characteristic putrefactive odor that, in cases of extensive involvement of the lungs, permeates the entire room, and renders diagnosis possible without examination of the lung or knowledge of the associated pathologic findings, or the previous history of the patient.

The pleural cavity of patients who have succumbed to gangrenous infection may contain a small amount of turbid fluid, or there may be signs of beginning acute purulent pleuritis. In some instances small subpleural abscesses have ruptured into the pleural space, causing massive infection with advanced purulent pleuritis. There may be light adhesions over the lower lung which are easily broken apart, or dense walling off of true empyema pockets in the patients who have survived for a considerable length of time. The pleura early loses its glistening appearance, and may be covered by an exudate. The process usually is too brief to allow much organization of the exudate.

The involved portion of the lung has an increased density and feels nodular, as in ordinary bronchopneumonia. On cut section of the lung, one notes the putrid, sweet odor typical of gangrenous pneumonia. The trachea and bronchi may contain purulent exudate, and the mucous membrane is bright red in color and edematous, showing the acute bronchitis almost universally present. This condition extends into the finer bronchi. Very often, in more extensive cases and those apparently of long duration, there is a dilatation of the smaller bronchi, a typical bronchiectasis. Some of these bronchi are completely filled with rather dense exudate, which, on manipulation or squeezing, can be easily pressed out. The pneumonic process, as a rule, involves the more dependent portion of the lung and is bilateral; although one portion of the lobe may be involved on one side more than on the other. Only in very extensive and speedily fatal cases are large areas of the lung involved, and in such instances the entire lung may contain small abscesses. The affected portions are gray to grayish brown, and lie around the bronchi. These areas as a rule have circular borders and may show multiple lighter areas in their midst, due to small patches of necrosis throughout the tissue. The pneumonic areas contain small abscesses. They may vary in number in different parts of the same lung, depending on the degree to which the gangrenous process has advanced. They vary in size from a few millimeters to 1 cm. or more; the walls are ragged and irregular, and may be multilocular in form. The intervening lung tissue may show little or no reaction, and may be bright red, due to hemorrhagic edema; exudate may be readily squeezed from this portion of the lung. Should the process be of longer duration, the intervening tissue may be granular and dark red. (Figs. 6, 7, 8 and 9.)

In most cases the trachea and larger bronchi show the typical histologic picture of an acute tracheitis and bronchitis. The cells of the mucous membrane are swollen, and polymorphonuclear leukocytes have invaded the submucosa, which likewise shows an infiltration of serum. The smaller bronchi and bronchioles may be plugged with great numbers of leukocytes. Many bronchi in the midst of the pneumonic area have no distinguishable mucous membrane, but are filled with a homogeneous, deep blue-staining mass of debris surrounded by leukocytes, or the process may be so extensive that one would not be able to recognize the structure as a bronchus, were it not for the adjacent artery, as the walls of the bronchus have been destroyed by necrosis and gangrene. (Figs. 10, 11, 12 and 13.)

The reaction in the parenchyma is typical. One finds varying stages of the disease throughout the lung, from small abscesses made up of great numbers of polymorphonuclear leukocytes, to areas of necrosis of the entire structure of the alveoli and interstitial tissue, the latter simply remaining as a skeleton without noticeable living nuclei. An advanced stage is the more common finding of fairly large necrotic areas having in their center a mass of structureless debris, the gangrenous lung tissue, which takes a deep blue basic stain with hematoxylin and eosin-stained

sections. These gangrenous areas are often seen to be in close proximity to a small bronchus, and in some sections seem to spread from the bronchus. (Figs. 10 and 11.)

The most characteristic microscopic picture and one which distinguishes gangrenous pneumonia from ordinary postoperative bronchopneumonia is the areas of gangrenous abscesses in the midst of lung tissue which usually shows little reaction. This unaffected lung tissue is in striking comparison to the extensive necrosis, resembling a consuming, destroying inflammation. So virulent does this process appear, and so sharp is the distinction between the affected and nonaffected lung tissue, that one may conceive it to have been caused by some strong reagent which acts speedily over a localized area and causes quick local destruction of tissue. The gangrenous areas have in their center the homogeneous sructures, deep blue-staining tissue, the tissue debris. Surrounding this is an area of necrosis, the structure of the alveoli, blood vessels, and so forth, remaining as a skeleton without visible living nuclei. This zone may be surrounded by a few polymorphonuclear leukocytes, lymphocytes and serum, which fill the adjacent alveoli. Farther from this area and in the remaining alveoli, there may be a collection of serum with a few red blood cells; it is the rule that the demarcation be clean cut and distinct between gangrenous areas and intervening parenchyma. However, the adjacent tissue may show evidence of more advanced exudate with a variable number of leukocytes, in proportion to serum. (Figs. 12 and 13.)

It seems probable that the process has extended by way of the bronchi, since the gangrenous areas are usually in the neighborhood of the bronchi, since necrosis is so often found directly in their lumina, and since the trachea and larger bronchi show the evidence of a very acute bronchitis.

In some instances, food (gastric contents) has been found in the bronchi. The microscopic search for foreign material in the stained sections has not been satisfactory. In no instance were we able to distinguish vegetable or meat fibres. This is to be expected, however, because the process is so extensive, so rapid, and necrosis develops so early that recognition would be almost impossible.

Laboratory studies, when made, reveal large numbers of putrefactive bacteria which can be easily identified by ordinary smear. The fusiform bacilli and spirilla predominate.

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DISCUSSION

DR. C. C. DAVIS, Albuquerque, N. M. (Opening discussion): I have listened with great interest to Dr. Lemon's paper and think we are singularly fortunate in having a man of his experience and knowledge with us. I feel that the field has been covered so thoroughly that anything I might say would neither add to nor detract from the paper the doctor has read.

One or two questions came to my mind and I think if we can carry away with us a satisfactory interpretation, it will be a great help to the men in the Southwest, dealing to a great extent with pulmonary conditions. It seems from the paper that the principal thing in the aspiration pneumonia of the gangrenous type is the prevention of this complication, and the doctor covered that very thoroughly, telling us just how that could be done and thus avoid the complication. The question of anesthesia occurred to me, and I wonder what his opinion is in regard to that in pulmonary diseases. I noticed some of the cases developed very late. It would seem there was not a very great amount of irritation from ether anesthesia immediately following the operation, but I wonder if in some of these late cases it was not due to a delayed reaction and thus the gangrenous type developed later.

In the Southwest we have a great deal to do with surgery in complicating pulmonary conditions and we have had to sacrifice ether anesthesia to a great extent because it seems that, although ether does not apparently affect the lungs at the time, still, later on, we get a great spread of the tuberculous condition in the chest, which is avoided by using a combination of local anesthesia with twilight sleep. I should like to have Dr. Lemon's opinion in the use of twilight sleep with morphine and subsequent local anesthesia. We apparently get very good results with our surgery as far as lung complications are concerned, and seldom get any extension of the tuberculous condition of the chest by the above method.

DR. A. M. FORSTER (Colorado Springs, Colo.): I feel that Dr. Lemon ought to be congratulated on the wonderful detail with which his subject has been prepared. There is one particular point which I feel is of special note in this paper, and that is the demonstration of the sympathetic co-operation between the internist and the surgeon. I wish to mention two cases I happened to recall as Dr. Lemon was reading his paper.

One was a case of obstruction of the esophagus, and we saw very clearly under the x-ray when the patient attempted to swallow barium, that it went down into the esophagus, met the obstruction and returned, flowing over into the larynx and trachea. The patient had had this condition for a number of years and was doing the same thing with his food, afterwards coughing it up from the trachea and bronchi.

The other was a case of empyema, and by injecting barium into the pleural cavity you could see through the fluoroscope the barium pass into a bronchial fistula and then into the trachea, up to the larynx and down the esophagus without producing any conscious symptoms.

DR. K. D. LYNCH (El Paso, Texas): I think this paper needs a good deal more discussion than those which fol-

low it. I am actually interested from the standpoint of the surgeon. I believe that the majority of cases at the Clinic are given ether anesthesia and I think in a way, from listening to Dr. Lemon read his paper, that he has come to the conclusion that it is not so much the character of the anesthesia that has to do with this type of pneumonia. I have followed the methods at the Clinic for a good many years and have operated upon a considerable number of tuberculous kidneys in the Southwest and have given every one of these cases ether anesthesia, whether with active tuberculosis, or arrested tuberculosis. We have had no difficulty whatever in sixty-two cases operated upon for tuberculosis of the kidney with ether anesthesia. The sixty-third case was one that demanded nitrous oxid anesthesia. He was under Dr. Homan's care and developed very rapidly progressive tuberculosis and died.

I use a great deal of spinal anesthesia and have had one case followed by pneumonia. The case got well—apparently of the embolic type.

We are all doubtful as to what does cause these postoperative pneumonias and have not had the chance to follow these cases up. It has been a great treat to listen to this paper and find out that in a great number of the cases some at least will be considered aspiration pneumonias.

We have had four other cases of apparently an embolic type in operations done in the lower portion of the body, where the actual aspiration from the throat did not enter into the question."

DR. W. S. LEMON, Rochester, Minn. (closing discussion): In reply to a question, I will make this statement. A great many splendid surgeons have given inhalation anesthesia (using ether) to tuberculous patients. I do not advise the use of ether in such cases unless it is very necessary. Tuberculosis is a chronic pulmonary infection, and one avoids inhalation anesthesia in the presence of all chronic pulmonary diseases whenever possible, in order to prevent a recurrence of the disease which in tuberculosis may stimulate activity in the lesion, and in chronic bronchitis or bronchietasis may stimulate acute infection and bronchopneumonia, a complication that is not unusual and is similar to that following the use of ether anesthesia in cases of acute bronchitis, coryza, pharyngitis or other acute infection of the respiratory tract.

Regarding the aspiration phenomenon mentioned by Dr. Forster, it becomes necessary to emphasize the protective mechanism of the lung rather than its vulnerability, as I have done. Undoubtedly many instances of fairly gross aspiration occur, but the healthy lung with a normal cough-reflex rids itself of its foreign material quite promptly, and no serious complication results.

THE AMBULATORY TREATMENT OF PEPTIC ULCER*

ERNEST CLYDE FISHBAUGH, A. M., M. D., F. A. C. P., Los Angeles, California.

The methods of treatment of peptic ulcer have varied from time to time in the hands of various schools of clinicians. The procedures advocated by such eminent men as Leube, Lenharz, Sippy, Mayo and Moynihan, with which all are familiar, emphasize the diversity of teaching in the care of this disease. All of these divergent methods have yielded excellent results in the hands of their respective advocates. Sir Berkeley Moynihan, in discussing the medical treatment in his recent article, "Diagnosis and Treatment of Chronic Gastric Ulcer," states: "A really serious attempt to treat all cases of chronic gastric ulcer by medical treatment should be made." In reviewing the various methods of medical treatment he concludes that, "The most rational of all methods is that introduced by Sippy which would appear to meet more combatantly those conditions in the stomach which we believe must be controlled before an ulcer can have a chance to heal."

It is quite evident from a careful review of the literature that the strong tide of opinion in favor of surgery in all cases of ulcer is rapidly subsiding and that careful medical management should precede operative interference in the vast majority of cases.

Gastro-enterologists are constantly coming in contact with patients having had gastro-enterostomy, pyloroplasty, pylorectomy, excision of the ulcer and so forth, who have had a return of their previous symptoms,

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even though the surgery was performed by most excellent men. In fact, it would seem quite unreasonable to assume that even though one ulcer was completely cured another could not occur. Such must frequently be the case.

The decision as to what method should be utilized in the treatment of any case must depend upon a most careful study of the case. Such study should consist of a carefully taken history, thorough physical examination, Wassermann test, complete blood count, urine examination, fractional test meal, numerous stool examinations and a thorough x-ray study of the kidneys, gall-bladder and gastro-intestinal tract. Attention should be directed in all cases toward the localization and eradication of possible foci of infections.

From the study of large series of peptic ulcer patients the methods of treatment may be briefly classified as follows:

I. Surgical.
   - A. Perforating ulcers.
     - (1) Complete.
     - (2) Incomplete.
   - B. Obstructing ulcers.
   - C. Chronic indurating ulcers.
   - D. Ulcers with recurring hemorrhages.

II. Medical. (All cases not included under surgical.)
   - A. Rest-in-bed cases.
     - (1) Hemorrhaging ulcers.
     - (2) Marked pylorospasm with gastric retention.
     - (3) General debility.
     - (4) Expediency.
   - B. Ambulatory cases.
     - (1) All cases not included above.

After a thorough study as outlined above it is quite easy to select from this simple classification the method of treatment which would yield the most favorable prognosis.

A review of our last one hundred private patients demonstrated to have peptic ulcer by examination, operation or results of medical treatment, showed the relative proportion of methods of treatments employed to be as follows:

1. Surgical Cases: Five.
   - A. Perforating: Three.
     - (1) Complete: None.
     - (2) Incomplete: Three.
   - B. Obstructing: One.
   - C. Chronic Indurating: None.
   - D. Massive, recurring, hemorrhages: One.

II. Medical: Ninety-five.
   - A. Rest-in-bed: Six.
   - B. Ambulatory: Eighty-nine.

From this table it is evident that the vast percentage of peptic ulcers occurring in private practice can be successfully treated by the ambulatory method.

The success of the ambulatory method is dependent upon certain factors, namely:

1. Absolute co-operation of the patient. Individuals presenting themselves for treatment in private practice are usually delighted to know that they can be relieved of their distress and pain and be cured without the necessity of going to bed or giving up their work. They are usually sufficiently intelligent to carry out all orders if given careful explanation and instruction as to the cause of their symptoms, the manner by which the symptoms may be relieved and the necessity for the utmost promptness and diligence in complying with every detail of the treatment. The explanation should be given with great care and the directions carefully written. The patient should be seen daily until all symptoms are completely relieved and then less frequently as seems advisable. The patient should be encouraged to report immediately any unusual manifestation.

2. The treatment should continue over a long period of time. This is possible only if the patient understands that relief of symptoms does not mean a cure. A firm cicatrix means months of freedom from all irritation.

3. Instruction should be given as to the early symptoms of reappearance of the ulcer. The onset of any indigestion, gastric distress, belching or heaviness should be considered a warning and if properly managed will quickly disappear, while if allowed to continue will result in the reappearance of pain and the breaking down of the old ulcer or the beginning of a new one.

Patients who have had recurring attacks of ulcer admit that the early symptoms of the reappearing ulcer were neglected. Doubtless numerous reappearing ulcers and post-operative recurrences could have been avoided if the patients were properly advised and educated in this respect.

The ambulatory method of treatment, like all other forms of treatment, is based on certain principles.

1. An ulcerated surface is present.
2. The ulcerated surface must not be irritated.
3. Hydrochloric acid, being an irritant, must be neutralized.
4. Stomach should not become distended.
5. The patient must receive sufficient food value.
6. There should be sufficient bowel elimination.

A detailed explanation of each of these principles to the patient is essential in securing his co-operation.

Two types of diet have been utilized: (1) Milk and cream. (2) Non-stimulating soft foods. Eighty-six (91%) of the ninety-five cases treated medically in the above group of cases were managed on milk and cream alone. Nine per cent were fed on non-stimulating soft foods.

Milk and cream in proportion of two parts of whole milk and one part of cream has seemed to be an ideal combination. The milk and cream is non-irritating, non-stimulating, has high caloric food value and undoubtedly controls the excess acidity to a considerable degree. The combination of milk and cream is given at two-hour intervals eight times a day. The size of each feeding at the onset of this diet is determined by the emptying time of the stomach as observed by the fractional test meal and the x-ray examination. If the stomach, during the laboratory study, emptied within three or four hours, it is safe to allow six ounces of the milk and cream mixture at each feeding on the first day. If there is no sensation of fullness at the end of that day eight ounces may be given the following day. If there is evidence of pylorospasm smaller quantities are given at the onset in addition to therapeutic doses of atropine or tincture of belladonna. The quantity of milk and cream is gradually increased until the patient experiences no hunger sensation or emptiness and still is not sufficient to produce fullness or distress in the late afternoon. Many patients are able to take from ten to twelve ounces at each feeding. The average sized patient will lose very little weight on the eight-ounce feedings, and will gain when taking ten to twelve ounces. On this quantity of food there is no complaint of weakness or hunger even at the onset of the treatment.

The excess acidity is further controlled by the use of sodium bicarbonate, magnesia and bismuth in various combinations. The amount of alkali needed is determined by the results of the fractional test meal, the relief of symptoms and the amount of acid present in the stomach at the end of the day. In most instances it is unnecessary to do evening lavage in order to know that the acidity is controlled and that the stomach is emptying properly, as the patient's freedom from distress is a good index.

Magnesium oxide is added to the powder combination in quantities sufficient to regulate the bowel move-

ments. Patients taking ten to twelve ounces of milk and cream should have two to three soft formed stools daily.

The powders are prepared in bulk, patient taking one teaspoonful, or less as needed, from one-half hour to one hour after each feeding. The powder should be repeated as often as necessary to prevent any gastric distress. By individualizing the amount of alkali given each patient there should be no occasion or fear of alkalosis. The fractional test meal gives guiding information in this regard.

The patients remain on the milk and cream diet for four to six weeks and at the end of this period, in many instances patients would rather continue on milk and cream than eat other foods. They are slowly given non-stimulating, soft foods such as well-cooked cereals, rice, soft eggs, baked potatoes, very tender or pureed peas, finely chopped spinach, baked or broiled chicken, broiled lamb chops or filet steak, custards, plain ice-cream, apple sauce, baked apple, puree of prunes, dry toast or stale bread. Three small meals selected from this list of foods are allowed and, in addition, milk and cream with each meal, midway between each meal and on retiring. The powder is given at regular intervals after each feeding and gradually decreased in amount.

The patient should continue on a bland sort of diet for several months and abstain from overeating, all forms of stimulating foods, condiments and alcohol.

The remaining nine cases, or nine per cent, were given practically the same foods as those coming off the milk diet. They were placed on the soft, non-stimulating foods because of their aversion to milk and cream.

Their management was less satisfactory. It is difficult to carry soft foods to work and take them at intervals of every two or three hours. The milk and cream is readily carried in a thermos bottle and requires very little time and causes little inconvenience.

The ambulatory treatment of peptic ulcer can be successfully conducted in the vast majority of private patients. It is needless to state that the economic factor is tremendous. Patients requiring hospitalization not only pay large hospital bills but lose their income.

CONCLUSIONS

I. The majority of private patients with peptic ulcer can be treated successfully by the ambulatory method.
II. Milk and cream in proper combination is an ideal diet for this form of treatment.
III. Economically the ambulatory method is highly desirable.

DISCUSSION

DR. W. H. WOOLSTON, Albuquerque, N. M. (opening): It has been a plesaure to review Dr. Fishbaugh's paper. The Society is to be congratulated on having him here. It is a rational method of medical treatment in the majority of acute cases. It does away with hospitalization, which means a great deal to the patient economically. However, though I can subscribe to almost everything Dr. Fishbaugh has said, our point of view may be slightly different in respect to the chronic peptic ulcer, since my training and experience have been largely. surgical.

In the history of peptic ulcer, the periods of excerbations and improvements are characteristic and it has been shown at autopsy that a certain number have healed without treatment; therefore, we must be circumspect in concluding that medical treatment alone has been the factor in relieving symptoms. However, careful medical treatment usually results in great or permanent improvement. Successful management under a strict Sippy regime requires several weeks' hospitalization and a prolonged dietary regimen afterwards, which is out of question for a great majority. That is why Dr. Fishbaugh's method should be an improvement on the Sippy treatment if it will fit enough cases. Surgical treatment results satisfactorily in 90 percent of duodenal and 80 percent of gastric ulcers after operation. The common types of operation are the Billroth I-II, Polya, Finney pyloroplasty, Horsley operation, excision, gastro-enterostomy with pyloric occlusion. The operation must be fitted to the patient rather than the patient to the operation. Gastro enterostomy has fallen into ill repute largely due to its abuse and indiscriminate use. We have found that the Polya operation has a larger field of usefulness than most of the other methods.

The acute simple ulcer is infected superficially and can be cured by medical means,

but the chronic is infected through the deeper layers of the stomach or duodenum and cannot be reached by medical therapy. The ulcer surface heals and leaves an indurated, infected area, so we have recurrences in spite of a strict diet. The only cure is the removal of this area when possible. The difficulty is that they are subjected to repeated medical cures, so that when the surgeon gets them, a certain percentage have perforating ulcers, adhesions, etc., which make a resection out of the question.

Average mortality of acute and chronic ulcers surgically treated, from all causes, is 2 percent in duodenal (which rarely become malignant) and 3.5 percent gastric (which often become malignant). Finsterer's mortality in 407 cases was 4.4 percent; in the last three years 1.8 percent.

Chronic ulcer tissues lose the power of repair, apparently. There is a rim of dense scar tissue around the ulcer and in its crater. A close parallel is the varicose ulcer. There is repeated healing and recurrence as long as we leave the pathology, focus of lowered resistance in the scar, and the etiological factor is still present.

Hyperacidity is described as one of classical signs of peptic ulcer and therefore should be reduced by alkaline treatment and a non-irritating diet. But if one accepts the judgment of A. J. Carlson, Professor of Physiology at the University of Chicago, there is no disease known capable of producing a true hyperacidity, and the pathologic deviation in acid and pepsin is invariably in the direction of decrease and at best we have a hypersecretion caused by hyperactivity of the acid cells about the antrum. It has been further established in gastric and duodenal ulcer unaccompanied by pyloric obstruction that there may be normal acidity (10 percent of cases) or a complete achylia. So the indiscriminate use of alkalis and the non-irritating diet of modern medicine cannot be rational in this group of cases which cannot be distinguished clinically from the rest. Alkalosis occasionally results from its use. We can't turn the patient loose on alkalis, therefore frequent visits to the doctor and frequent stomach analyses are necessary.

The internists who claim a cure of 95 percent of all ulcers are very optimistic. They should have the opportunity of operating on some of the cases the surgeon gets who have had repeated cures, and especially the 5 percent they grant the surgeon. Perforating or penetrating ulcers adherent to the head of the pancreas or gallbladder or surrounded by adhesions, hemorrhaging ulcers in which the patient is a fine risk, or the gastric ulcer which has become malignant.

It is surprising the mortality is not higher. I do not mean by this that all ulcers should be treated surgically, but I think more of them should be given the benefit of surgical treatment sooner and not procrastinate with a chronic ulcer which is a surgical condition. All acute cases should be treated medically; preliminary and postoperative medical treatment until the altered physiology has become adjusted, which it quickly does, are of great importance to the surgical treatment. The salvation of the internist, if he wants 100 percent of the peptic ulcers, is to diagnose them early, and by the accurate methods Dr. Fishbaugh has described and the x-ray, which is accurate in 95 percent of cases, this is quite possible.

From what I have said, you can see that I am surgically inclined, but I do not want you to feel that I am criticising Dr. Fishbaugh's paper at all; I am simply taking this opportunity to present the surgical treatment in a brief and very incomplete manner.

DR. R. O. BROWN (Santa Fe, N. M.): There is one thing I want to say in regard to Dr. Woolston's contention as to the frequency of new ulcers and the recurrence of old ulcers. I happen to have a close knowledge of one case where an old ulcer was healed apparently and a new ulcer developed and the condition following it was the cause of death. It happened about a year ago. The patient had a very severe intestinal hemorrhage, which was the first thing that warned him there was anything radically wrong. He had had indigestion for over a year and a half and had been treated by a doctor who had not investigated very thoroughly, but had told him he "had a little indigestion", to "modify his diet," etc. He passed at one time several quarts of fluid blood, following a period of about a week, during which he noticed his stools were dark in color. He was taken to the hospital immediately and a diagnosis of duodenal ulcer made on clinical findings and x-ray. He was placed on a diet and kept in bed for about a month and a half and then allowed to be up and around a little. He was very weak, 76 years of age, but the distress left him, and he was all right until about the beginning of November. We had more x-rays taken then which showed the outline and shadow of the duodenum just about as they were before. There had been practically no symptoms. On the 8th of November he had another hemorrhage, passing at least one pint of fluid blood by rectum, following three days of slight distress. He was again placed on a soft diet. There was continual bleeding from the time of the second hemorrhage right straight along until he was placed on a Sippy diet, with alkalis and neutralizing powders of soda bicarbonate and calcium carbonate. After a week of this treatment, bleeding apparently stopped. Chemically, there was no trace of blood in the bowel movements. The kidneys, however, were not in very good shape. While alkalosis was not shown by blood chemistry, the blood alkalinity was reduced below normal, though within the boundary of safety. There was, however, increased blood urea found. He gradually developed uremia and died. Postmortem showed old healed duodenal ulcer;

about one and a half inches from it, higher up in the duodenum, was a recent ulcer, about three-quarters of an inch in diameter, which was not at that time bleeding, but was healing over. Injection of methylene blue solution did not show any leakage at all from the vessels in the ulcer, but there seemed to be no question at the postmortem but that the old ulcer had been healed over to the extent where it was causing no trouble and the small and new ulcer was the one that was giving the trouble. There was no evidence of focal infection anywhere else in the body, and why the ulcer should occur was not very clearly brought out. Only one thing pointed to the trouble, and that was perhaps the spleen. Blood pressure had not been over 140 at numerous examinations during the last fifteen years, but in spite of that fact, there were found markedly contracted kidneys, and marked arteriosclerosis —the kidney lesions being apparently the cause of death.

DR. E. C. FISHBAUGH (closing discussion): I wish to thank the Society for the invitation to be present at the state meeting; I have enjoyed being with you very much and appreciate greatly your courtesy.

As far as the surgical treatment of ulcer is concerned, we all realize that there are a great many surgical cases, and we also realize that medical treatment does not cure all cases by any means, but neither does surgical treatment.

Last year we saw two ulcer cases that were enormous in size. One of these gastric ulcers was operated upon and found to be two inches in diameter. This man had been operated upon four years previously, and about two months later the ulcer recurred. At the second operation it seemed practically impossible to do anything because of the numerous adhesions, and because of the size of the ulcer, so the surgeon cauterized the ulcer. The man had been completely free of symptoms for three weeks, was on a regular postoperative diet, when suddenly he had a sharp pain in the abdomen, followed by hemorrhages. He again came into my hands. Under medical management, the ulcer healed and he has been entirely free from all symptoms for eight months.

The other case was a man who died from hemorrhage and on autopsy an ulcer was found which was four inches in length, one and one-half inches in width. Of course, such an ulcer could only be treated by cauterization and not by removal.

CASE REPORTS OF CERTAIN DISEASES SIMULATING TUBERCULOSIS*

A. M. FORSTER, M. D., and T. J. KINSELLA, M. D., Cragmoor, Colorado Springs, Colo.

Our idea in presenting this paper is to illustrate with a few brief case reports some of the diagnostic problems which present themselves in an institution devoted almost entirely to the handling of tuberculosis. These cases were either sent to us with the diagnosis of tuberculosis or with the failure to recognize complications which were very important from the point of view of treatment. We feel that such problems often face the general practitioner and that it is always timely to attempt to throw some light on the question of differential diagnosis.

Since the World War we have all recognized the importance of non-tuberculous lung infection as a cause of chronic illness, and we have learned to be careful not to call every chronic lung infection tuberculosis. This is particularly necessary because so often the non-tuberculous lung infections follow some focal infection of the upper respiratory tract, and, unless this focal infection is properly cared for, there is little hope of cure of the lung condition itself. In fact, we feel very strongly that it is particularly necessary, whether in tuberculosis or other conditions, to make a thorough investigation of the upper as well as the lower respiratory tract.

Case one is not presented because of any unusual features, but simply because it is typical of the type above mentioned. The patient was considered to have chronic pulmonary tuberculosis of long standing. However, repeated sputum examinations failed to reveal any tubercle bacilli and the x-ray disclosed sinusitis. With the clearing up of the sinus condition and the institution of postural drainage, we hope to be able to return this patient to active life. An interesting point is that in spite of the long standing chronic lung infection this patient has no definite clubbing

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of the fingers.

Case two illustrates the importance of the most careful search to determine the exact etiology of a non-tuberculous lung infection. This patient had been diagnosed as tuberculous, but, on account of the fact that the organisms found in his sputum were atypical and also on account of atypical physical signs and symptoms, we questioned the diagnosis. We made a most careful cultural study of his sputum and finally proved a streptothrix infection. We found the fungus in his sinus discharge as well as his sputum. Operation on the sinus, postural drainage, bronchoscopy and iodid medication and a number of small doses of neosalvarsan finally got the aptient in such condition that he was able to return to a fairly active life.

The mistaken diagnosis in case three has no influence on the patient's outlook, but it was of some importance that the diagnosis was cleared up. This case had physical signs of an old fibroid tuberculosis in the upper right lobe. However, the sputum was negative, although it constantly contained a small amount of blood. In the lower left lobe there was an area of dullness with distant breathing and a few creaks and clicks. The x-ray showed a very sharply defined triangular shadow with its base at the hilum. We made a tentative diagnosis of malignancy which was confirmed later when the patient expectorated a small mass of tissue which showed carcinoma. Autopsy demonstrated the old apparently healed tuberculosis and the carcinoma. The patient also had carcinoma of the pylorus. An interesting point was that for several months following his arrival at the sanatorium he gained weight and improved in every way. It was not until about two months before his death that he developed any abdominal symptoms. Naturally the inference would be that the pyloric cancer was primary, but it is curious that for a long time all the symptoms were referable to the lung condition. The patient ran a constant low grade temperature which was in no way different from that often seen in tuberculosis.

Case four is presented to illustrate the great difficulty in differential diagnosis of tuberculous enteritis. This patient has typical physical signs of moderately advanced pulmonary tuberculosis. While her sputum was negative, we could not discover any other explanation for her lung condition and we feel positive that she had the pulmonary tuberculosis. During the seven months she was under our care she had persistent diarrhea with marked anorexia and frequent vomiting. There was some tendency to localize the pain in the right lower quadrant, although there was considerable general pain and tenderness. It was possible to palpate a small mass in the right lower quadrant and there was a fairly constant gurgle present. The patient was very difficult to handle and the abdominal symptoms failed to show any improvement with the usual dietary and medicinal treatment for tuberculous enteritis. Her stools were negative for parasites or dysentery bacilli and tubercle bacilli. However, they showed pus cells, red blood cells and some mucus. Sidmoidoscopic examination showed only an irritated mucosa with no ulceration or bleeding. The x-ray revealed hyperperistlsis of the small intestine, but the patient was unable to retain a barium enema and consequently we could not study the large bowel. The blood picture showed 10,600 white cells with 66 percent PMN. We finally recommended an exploratory operation and the patient returned to her local surgeon, who is reported to have found a subacute appendix with no abscess formation and with no macroscopic evidence of tuberculosis. In the last report the patient had gained 34 pounds and was free from digestive symptoms.

Case five we consider most unique and well worth adding to the literature. Laryngologists tell us that differential diagnosis in their sphere is largely confined to the triology of

syphilis, tuberculosis and malignancy, and we know that it is often extremely difficult from the local examination alone to settle the question. This patient was sent to us with a diagnosis of pulmonary and laryngeal tuberculosis. The physical signs in the chest showed very extensive involvement of the right upper and middle lobes and the entire left lung. There was marked dullness in this area with broncho-vesicular breathing, but very few rales. The larynx showed extensive ulceration of the epiglottis with infiltration below. The sputum was negative for tubercle bacilli. The patient was desperately ill and after several weeks on account of extreme dyspnea, it was necessary to do a tracheotomy. We did not make a positive diagnosis before death, but our feeling was that we were dealing with malignancy both in the larynx and the lung. The autopsy report is most remarkable. The lesion in the larynx showed an infiltrated carcinoma of squamous cell type. There was no cancer in the lung, but as indicated by the physical signs, very extensive tuberculosis. A lymph node taken from the right side of the trachea showed carcinoma and one from the left side on the same level showed tuberculosis.

Case six had very definite and extensive tuberculosis, but we present it because of the complicating malaria which is so frequently masked by the tuberculous symptoms. We have learned to search most diligently for malaria in all our patients from the south. Some few months ago we found the plasmodium in a patient from Wisconsin who had never been in the south. In the case under consideration there was nothing about the symptoms to indicate the malarial complication. This patient has periodic attacks simulating renal colic and her urine on these occasions had much pus. Cystoscopy demonstrated pyelitis on the left side and the urine from the kidney was positive for tubercle bacilli. This case, in addition to the pulmonary tuberculosis, had the following complications: Tuberculous laryngitis, tuberculous kidney, malaria, and pyelitis.

In case seven we are hardly prepared to give a positive diagnosis. This case was sent to us with a diagnosis of pulmonary tuberculosis and in our opinion the physical signs were sufficient to make us feel very strongly that the diagnosis was correct. There was practically no sputum at any time while the patient was under our observation and the small mucoid specimens which the patient was able to give us were constantly negative for tubercle bacilli. The complicating condition which we report apparently developed after the patient had been under treatment for some time. The following chart of blood findings is extremely interesting:

Date	R.B.C.	W.B.C.	Hbg.	S.M.	L.M.	Neut.	Eosin	Basop	Trans	Myelo	
8-19-23		11,000	90	40	2	54	1	2	1		
9-28-23	4,350,000	26,800	100	83	2	10	1	0	0	4	
10-1-23		17,250		88	0	9	0	1	1.	1	Normoblasts 0
10-8-23		11,500		77	2	17	1	1	2		Oxydase stain
10-18-23		11,300		48	1	45	2	0	4		shows large
10-31-23		7,400	95	60	0	36	3	0	0	1	lymphocytes
11-9-23		12,759		50	2	43	2	0	1	2	not to contain
1-10-24		7,000		48							oxydase.

The patient ran a slight low grade temperature, was very nervous and restless and had general enlargement and tenderness of the surface lymph glands; she also had a recurrent slight epistaxis. During the period of most marked enlargement of the lymph glands the temperature went as high as 100.5 degrees. A recent report after seven months indicates the disappearance of all signs and symptoms.

We have only one excuse for pre-

senting case eight and that is because occurring in a nurse handling tuberculous cases, the inference drawn by our patients was that she had developed a tuberculous meningitis. Needless to say this case was extremely interesting to us because recovery occurred. A few days before the onset of her illness she noticed that she had a small pimple just within the opening of the left nostril. This gradually developed in size with slight shooting pains through the left temporal region toward the occiput. About noon one day she suddenly developed excruciating pains in the back of her head and neck and down the spine. For five days spinal puncture revealed a bloody fluid which was under some pressure. The blood gradually cleared up, but the symptoms of meningitis increased. In all the patient had seven spinal punctures. This, with the use of opium derivaties and anti-streptococcus serum, constituted the treatment. Careful laboratory investigation proved that the infection in the nose, as well as in the meninges, was a streptococcus.

DISCUSSION

DR. W. A. GEKLER, Albuquerque, N. M. (opening discussion): Dr. Forster's paper again emphasizes the fact that tuberculosis cannot be divorced from internal medicine and that the work of the so called tuberculosis or chest specialist must always be intensive internal medicine. We are all seeing cases which simulate tuberculosis with enough frequency to keep us on the alert for these conditions. I have seen in my public institutional work a great variety of conditions diagnosed tuberculosis; for instance, diabetes, nephritis, pernicious anemia, acute leukemia, carcinomatous metastases.

Among unusual pulmonary infections I have seen one case of infection with a yeast fungus which gave history and physical findings not to be distinguished from tuberculosis. The autopsy, however, revealed the true situation.

I have always been very much interested in malignancy combined with tuberculosis for the very good reason that I have never seen a case in which the two diseases coexisted. The finding of these two conditions in the respiratory tract is certainly most unusual and deserves a separate report in itself.

All of us doing tuberculosis work in this section of the country have constantly to be on the watch for malaria as a complication, for we all get patients from the south, where malaria is more or less prevalent. It is interesting to note that in a study made by the Public Health Service it was found that sleeping cars that have passed through the south might harbor malaria bearing mosquitoes and an individual coming into that car might acquire malaria without ever having been in a malarial district. I have had three cases of empyema complicated by malaria and they have all done badly.

Malignancy of the lung is a condition which we all occasionally see and in my experience these pulmonary malignancies, especially the primary ones, are apt to run a very atypical course. Sometimes they are very slow and give a history of two or three years of poor health, while other cases advance very rapidly. I do not remember a single case that did not run a low grade temperature and have a number of other symptoms quite suggestive of tuberculosis.

In the matter of treatment of tuberculous enteritis, men in this section of the country have taken the lead and are several years ahead of other sections. In public institutional work in the middle west it is usually impossible to do anything with intestinal tuberculosis because the patient's pulmonary condition progresses so rapidly that any form of treatment would be foredoomed to failure. In this part of the country, where pulmonary cases have a greater expectancy of life, the matter of the diagnosis of tuberculous enteritis is of considerable importance because we are able to help many of these patients when the diagnosis is made early. I do not believe that there is any one group of symptoms, signs or findings, upon which a physician can always rely as being typical of tuberculous enteritis. A patient with an open pulmonary lesion will always show tubercle bacilli in the feces if the search is intensive enough. On the other hand, however, they are never present in the same numbers as one finds in tuberculous enteritis. I know this is a rather crude rule to follow, but it has been the only one that has been fairly satisfactory to us. It is our custom to put any patient in whom we suspect tuberculous enteritis on heliotherapy at once.

In conclusion, I feel that a paper such as Dr. Forster has read should occupy a place on every program where tuberculosis receives any discussion at all. There are none of us who do not continually need to be stimulated to more careful work by reports of this nature. I would like to again emphasize that statement that I made in the beginning—that the practice of tuberculosis means simply intensive work in internal medicine.

DR. ORVILLE EGBERT (El Paso, Texas): Dr. Forster's paper is exceedingly timely before a body of this sort, regardless of whether or not we are internists. Men of the west, general practitioners and specialists are above the average as physical diagnosticians. Certainly on such an important subject it is pertinent that all points of differential diagnosis should be brought out.

As Dr. Gekler has said, there is no such thing as a chest man. I would go a little further and say there is no such thing as a specialist in tuberculosis; rather that he is an internist and, above all, a diagnostician.

But I rather doubt the advisability of emphasizing to the general practitioner back in the old states an occasional misdiagnosis of tuberculosis. It takes a good deal of moral courage in Mississippi and Pennsylvania to make a diagnosis of tuberculosis. A great many of those men learned considerable about physical diagnosis in the war and they send us now a much higher percentage of cases with tentative diagnosis of tuberculosis. I think they should not be discouraged in so doing. It is up to us to ferret out these rare cases. The man back there is up against it hard; he needs our support; his work as a general practitioner is to do the greatest good for the greatest number, and although he may occasionally do an individual the injustice of ranking him tuberculous when he is not, that is reparable. But it would be deplorable for us in any way to contribute anything that would cause the rank and file of the profession to take less seriously the crying need of early diagnosis of tuberculosis. So I think we should encourage these men in their diagnosis of tuberculosis and not offer discouragement.

I enjoyed the doctor's paper very much. It brought to mind a case I had, which had been diagnosed as tuberculosis. There was history of having lost weight for a period of six weeks, slight fever, cachexia. After blood examinations, I found one gamete of quartian malaria, but sufficient to make a diagnosis.

I recall another case who came west with diagnosis of tuberculosis. A call at midnight revealed the fact that he had had an enormous hemorrhage. He said, "I vomited blood." We all feel a little skeptical about a patient who insists that he has vomited blood. However, after some study a diagnosis of splenic anemia was made and removal of an enormous spleen has apparently cured the individual.

DR. A. M. FORSTER, Colorado Springs, Colo. (closing): I made no attempt to classify all the various conditions simulating tuberculosis, but simply chose a few interesting cases to illustrate certain of the main conditions which are mistaken, and which we ourselves frequently do mistake.

I hope my paper did not seem to be in a critical mood at all. I was very careful to introduce some of our own mistakes, and endeavored to make it appear all through the paper that we are making mistakes as well as other men.

I think what Dr. Egbert said of the diagnosis of tuberculosis by practitioners in the east is very timely and they should not be discouraged in sending us cases with tentative diagnoses of tuberculosis.

Dr. Gekler spoke of the cases of malignancy and the fact that they run a low grade temperature. My experience has been that they almost invariably do, and I have heard Dr. Lemon speak of that same fact. I was very much interested in what Dr. Gekler said about the finding of tubercle bacilli in the feces in complications of tuberculous enteritis. From our knowledge of tuberculous enteritis, before the complication occurs, it is our custom to institute heliotherapy, more as a general measure rather than because of any special value in the treatment of tuberculous enteritis, and we are extremely careful to regulate the diet of the patient.

Two of my colleagues (Drs. Webb and Gilbert) presented a paper the other day at Atlantic City on the question of the dietary handling of tuberculous enteritis. It has been our custom for a number of years to employ a modified regimen which we recommend in the treatment of gastric and duodenal ulcers. We try small and frequent feedings; three ounces of milk every hour, gradually adding some cream, until we have a mixture of three ounces of milk and one or two ounces of creeam. If the patient improves on this diet, we add two small meals, and we often find we are able to increase the patient's weight better by this method than by any other.

I wish to thank the officers of the Society for the invitation to be with you and for the reception that has been given me.

DIET AFTER WEANING

M. K. WYLDER, M. D., Albuquerque, N. M.

It has seemed to me that more information should be gathered relative to the proper procedure in feeding a baby after weaning. Volumes and volumes are written on feeding during bottle period, but almost nothing is written on what to do when we are forced to quit the bottle.

We all know that a baby cannot go directly from a milk formula to a course dinner, and yet in many households, too many, in fact, the meal is prepared and when the family are seated at the table a survey is made of the food in sight and some such remark as this is made, "Well, I guess we can give baby some of these mashed potatoes and gravy" or whatever food happens to be in sight that seems to be the least objectionable

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for the baby. The good Lord has given many babies wonderful stomachs and a large percentage of them thrive in spite of this abuse and neglect, but many fall by the wayside and others are handicapped in after years for proper nourishment and development in this most important period of their existence.

A breast fed baby must be given additional food as soon as he fails to show a regular gain. Some mothers can keep babies gaining regularly on the breast alone from ten to twelve months, but these are few indeed, and practically none can nurse beyond twelve months. After the baby ceases to gain, it is well to supplement one feeding which, if the baby is over six months old, should be given from cup and spoon, for if we substitute the bottle and nipple, the baby will have to be weaned twice, once from the breast and again from the bottle. As breast supply diminishes another and another feeding may be substituted until the baby is off the breast entirely. This change should be brought about so gradually that a constant gain is maintained and no upset whatever should occur from this change in the mode of life.

A bottle fed baby that has gained regularly and prospered on a satisfactory formula will, after about the ninth or tenth month, cease to gain if given no other food and become anemic and flabby. The reason for this is that the iron content of cow's milk is almost nil. Theoretically, the child is born with enough iron stored up in his body, principally in the liver, to supply his iron needs for the first eight or ten months. After this time iron must be supplied in his food if he is to continue to gain.

In bottle feeding after about the ninth month the sugars are diminished and the liquid added to the milk reduced, to the end that the average baby, by the time he is a year old, should be taking whole unmodified milk just the same as a breast weaned.

It has recently become almost a fad with many pediatrists to begin the use of green vegetables early; some advocate spinach, carrots, green peas and potatoes as early as six or seven months. This custom first originated in Germany, and some babies can stand this sort of thing, but others develop intestinal indigestion. The reason given for early use of these foods is to supply iron and other salts, but cow's milk is much richer in mineral salts than human milk and the only vegetable that contains any considerable amount of iron is spinach. If the baby is anemic, this may be given, as early as the eighth month, a teaspoonful at a time finely chopped or having been forced through a sieve or colander. However, this iron need may often be met more advantageously with the use of a tablespoonful of beef juice added to the bottle or fed from spoon. The best way to prepare beef juice is to cut round steak up in small squares, sear on hot skillet, and then squeeze the juice out with meat press. Fresh breads, hot cakes or biscuits should never be given; toasts should be put in the oven and dried out until they almost crumble.

In order that the child doesn't tire on one kind of bread, they should be varied; one may give zwiebach, graham, white and bran bread, and of the crackers, graham, soda, oatmeal and arrow-root may all be used. We may begin the use of cereals early; don't give the baby cereal any oftener than you would take it yourself; some feed morning, noon and night; once a day is sufficient. Fed too often, the baby will become disgusted and rebel. They should always be cooked from one to three hours and are better if cooked in milk and water than in water alone. Cream of wheat, farina, rice, oat meal, corn meal and hominy may be used. The coarser ones should be pressed through a fine sieve to break them up; they should be used with milk, but without sugar, as it is better not to educate the baby to use sugar, since sugar is such a concentrated food that it will likely destroy the taste for other foods. We may begin

the use of meats between the fifteenth and eighteenth months. A good way to begin is to scrape raw meat, make a small cake of it, heat on a hot plate until seared on both sides; we may begin with a teaspoonful and increase to a tablespoonful every other day for a fifteen months old baby.

Babies who do not get a sufficient amount of protein are likely to overeat of other foods that are perhaps harder to digest than would be a small amount of meat. A child should only be given meat once a day. If an exception is made to this rule, a thin slice of crisp bacon at breakfast will do no harm. A child that can take eggs should alternate with eggs one day and meat the next. We should begin the use of eggs very cautiously, as many children have an idiosyncrasy to eggs; it may be to the white or to the yolk or both; if skin tests are used, we can determine which, and if it is only to one, the other may be used. Children sensitive to eggs may develop urticarial eruptions, diarrhea or disturbances of digestive tract.

Soups have very little nutritional value; thick soups should not be used; broths and thin soups are valuable after an upset, as they supply liquid and the stomach can usually handle the small amount of nourishment they contain and at the same time they furnish sufficient bulk to satisfy the family that their baby is not being starved.

While not wishing to be dogmatic, I will give a brief outline of the way a baby may be fed at different ages, this, of course, can and should be varied considerably to meet the individual needs of each case. By the fourteenth month the baby's bottles should be reduced to three and two meals a day. In a general way, the feeding should be about as follows:

At 6 a. m., that is on waking, eight ounces of milk from bottle.

At 9 a. m., orange juice, prune juice or other fruit.

At 10 a. m., cereal with milk over it, toast or zwiebach, and milk from cup.

At 2 p. m., one tablespoonful of spinach, bread and milk from cup.

At 6 p. m., toast broken up with milk poured over it and milk from cup.

At 10 p. m., eight ounces of milk from bottle.

At 15 to 18 months, eggs and meat may be added, giving egg one day and meat the next. Four feedings a day are sufficient at this time and may be given more or less as follows:

At 6 to 7 a. m., according to family habits, orange or prune juice, cereal, bread and milk from cup.

At noon, egg or meat on alternate days, baked potatoes and other vegetables and bread.

At 6 p. m., toast, bread and jelly sandwiches or baked apple and milk from cup.

At 10 p. m., milk from bottle or cup.

At eighteen months to two years the feeding may be about as folows:

At 6 a. m., orange juice or other fruit, cereal, egg and some kind of bread.

At noon, meat cut in fine pieces (chicken, steak or lamb); vegetables such as potatoes, peas, string beans, carrots, spinach; desserts such as junket, tapioca, custard, sponge cake and cooked fruits.

At 6 p. m., bread stuffs, milk toast, dry toast, bread and jelly sandwiches, milk and fruit.

After this the child's diet remains about the same and gradually they approach the diet of grown persons; however, hot breads, rich pastries, hot cakes and meat more than once a day should be avoided until they get old enough to do like grown folks, that is, eat things because they like them, even though they know better.

DISCUSSION

DR. E. F. FRISBIE, Albuquerque, N. M. (opening discussion): I enjoyed Dr. Wylder's paper very much and think that he has covered the ground thoroughly. I believe there are several lines of study in recent years which have thrown much light on the subject of infant feeding, and one of these is vitamines. Heretofore we have been very much in the dark as to vitamines and used to recognize this as some indescribable sort of principle, we did not know what, except,

perhaps, that they were a little more prevalent in uncooked foods. Now we realize why they are of so much importance in the feeding of anyone, and especially a young child.

I think the suggestion of Dr. Wylder about a survey of the table by the parents is a good one, but only too frequently the table is first surveyed by the child and whatever the eye of the child happens to see that he might desire, the parents generally yield to that desire without any thought as to the child's welfare. It seems to me that the education of the parents is up to us. We do not pay enough attention to educating the parents and should impress upon them the necessity of using their judgment in what the child eats, rather than permitting the child's judgment, at least until the child has acquired a knowledge of what is good for him in the way of food, as well as in other matters.

One of the greatest changes in recent years in regard to infant feeding is the much earlier use of green vegetables, because of the importance of their use. They are now used in the second half of thef irst year of life, when heretofore they were advised only in the second half of the second year. A more convenient method of giving beef juice is to use the fresh juice that is always found on the pulp of rare steak and roast.

I think that especially strong measures should be taken towards discouraging the child in the use of excessively sweet foods, and particularly the habit of eating candy, which should be discouraged to the greatest age possible. After a taste of sweets is encouraged, it is likely to lead to excessive use, even in adults. This is particularly true in Americans, who are prone to indulge in sweets. I think the United States ranks first in the use of sweets over any other country in the world.

DR. M. K. WYLDER, Albuquerque, N. M. (closing discussion): I have not much to add to what has been said, but wish to thank Dr. Frisbie for her suggestions. The question of using green vegetables for vitamines is of doubtful value, to my mind, because you get more vitamines in orange juice than you do from any of these green vegetables, and the only excuse for using vegetables before the child is a year old is to give the iron that is in them, and the only vegetable that supplies iron in any amount is spinach. However, many men over the country are very enthusiastic about beginning to feed carrots, peas and beans from six months on. Others are reporting severe intestinal conditions in some of the babies who have been fed in this manner.

With regard to sugar and candy, the baby gets starch from cereals, and if we add sugar to the cereals we feed the baby, it takes away the appetite and he does not get the amount of other food he should. In giving babies candy, after they get large enough they insist upon it, and most babies rule the roost where they live. It does not do any more harm to give a baby candy than to give it sugar at its meals. That is not the time, however, when most people give the baby candy, as it is usually between meals. The time to give them candy, if you are going to give it to them at all, is right after feeding, and while on this point I want to say that when a child is brought to you by its parents and they say we cannot get our baby to eat anything just ask, "Does he eat between meals?" If they reply, "Oh, yes, we let him have a little lunch", the chances are the child nibbles all day and does not eat enough to supply his needs, and when meal time comes, not being hungry, he will not eat. They should be told not to let the baby eat between meals, and to wait until he gets good and hungry before feeding him. It will be a whole lot better for them if they will do this.

LENTICULAR DYSTONIA

Case Report*

E. A. DUNCAN, M. D., El Paso, Texas.

The patient is an unmarried Mexican woman of twenty-eight who complains of trembling and inability to walk or to perform any but the coarsest movements with her hands.

Her father, mother and two sisters are alive and well and there is no history of any nervous disease in her family.

The patient was healthy during childhood and adolescence except for an attack of typhoid at fifteen. There have been no other illnesses. She was not subject to headache. Her vision was always good except as noted later. There has been no impairment of hearing nor history of vertigo. She has had no nasal difficulties nor has she been subject to tonsillitis. She has had no glandular enlargements or goitre. There is no history of chronic cough, expectoration, hemoptysis, pleurisy or fever of obscure origin. She has never suffered with breathlessness, palpitation or chest pain. Her appetite and digestion have always been good but for years she has been constipated. There is no history of diarrheal attacks or of severe abdominal pain associated with nausea and vomiting. She has had no urinary disorders of any kind. She has never had edema of the face or feet. Her menstrual history is essentially negative. There have been no pregnancies. She has had no injuries or surgical operations.

(*Patient presented before the El Paso County Medical Society, March 24, 1924.)

In 1912, when the patient was sixteen, she became acutely ill with fever, headache and delirium. There was restlessness but no head retraction. Within four or five days after the onset of this illness she developed trembling and jerking movements of the head and extremities together with strabismus. At times the movements were of such violent character that, on several occasions, she fell from the bed. The fever subsided in the course of two months and with it the strabismus. The tremor and jerking movements also diminished to a certain extent but for six months she was unable to talk or to feed herself. No further history of involvement of the nervous system during the febrile illness can be elicited from the patient or her mother. She was now unable to stand or walk on account of the exaggeration of the movements on muscular effort; they did, however, disappear during sleep. The patient's condition then remained stationary for eight years when she began to show some improvement, the jerking grew less so that she became able to sit up. She has never walked on account of the violent jerking tremor of the legs nor has she been able to feed herself with a fork or spoon but can take food from a cup.

The physical findings of interest in the case are limited to the nervous system. The patient is well developed and nourished. Mentally she is clear but she has some tendency to senseless grinning and giggling.

There are no trophic changes in the skin, its appendages or the joints. There is no flushing, sweating or tache. There is no tenderness of the skull. The spine and joints of the extremities are all freely movable.

CRANIAL NERVES

1st: There is no disturbance of the sense of smell.

2nd: There is no impairment of vision nor contraction of the fields. The media are clear and the eye-ground negative.

3rd, 4th and 6th: There is no ptosis. The pupils are round, central, equal and react to light and with accommodation. Ocular movements are good in all directions. There is no nystagmus.

5th: Muscles of mastication contract strongly and equally. There is no disturbance of sensation of the face.

7th: The face is symmetrical. There is no weakness of the facial muscles or impairment of sense of taste on the anterior two-thirds of the tongue.

8th: Hearing is acute. There is no tinnitus or dizziness.

9th: Swallowing is undisturbed. Sense of taste present on posterior third of tongue.

10th: Uvula hangs in the mid-line and movements of the palate are unimpaired. There is no vocal cord paresis.

11th: Contractions of sterno-mastoids and trapezii are strong and equal.

12th: Tongue is protruded in the mid-line. There is no atrophy or tremor. Speech is strained and evidently accomplished with some effort, the voice varying constantly in intensity. This appears to be due to variations in expiratory muscle activity.

Motor System. The head is held erect and shows a constant coarse tremor which is greatly increased when the head is held in any strained position. When patient lies relaxed in bed there is no tremor but when any position is assumed which requires any muscular effort a very coarse, jerking tremor of the part results. The character of the tremor is almost choreiform. It is, however, a true tremor in that it consists in rhythmic, alternating movements. Patient cannot stand or walk on account of the violent movements of the legs. There is no Kernig or Brudzinski. There is some hyperextensibility of the elbow joints. There is no spasticity, loss of power or atrophies in any muscle group. All superficial and deep reflexes are present and there are no abnormal reflexes. Micturition and defecation are undisturbed.

Sensory System. Patient states that at times she has some formication in the right arm. There is no pain or numbness. Sensibility to touch, pain, heat and cold, position and vibration sense are unimpaired. There is no astereognosis.

Laboratory. Urine clear, acid., sp. gr. 1020; no albumin or sugar. The sediment shows epithelium in moderate amount. Blood Wassermann negative. Spinal fluid is under no abnormal pressure; cells two; globulin a trace; copper reduced; Wassermann negative.

To summarize, we are dealing with the results of an acute febrile illness with strabismus and tremor. Now after twelve years the patient exhibits an extraordinary violent tremor of the action type. There is no evidence of pyramidal tract disease. The lesion is located in the basal ganglia, the lenticular and caudate nuclei which form the corpus striatum, the locality damaged in the group of hyperkinesias known as lenticular dystonia which includes, among others, paralysis agitans, Huntington's chorea, torsion spasm, bilateral athetosis, progressive lenticular degeneration or Wilson's disease and certain post-encephalitic syndromes. The two last named are to be considered in this case. Wilson's disease begins with high irregular fever for a rather long period and exhibits muscular movements of the same character as in this patient. Rigidity, however, is a cardinal feature, late contractures develop, hepatic cirrhosis is always present though it may not be demonstrable during life. The disease is essentially progressive, the patient finally becoming bed-ridden and speechless, the average duration of the disease in chronic cases being about four years. This patient had an ocular palsy with the original illness. She has passed through a period of very definite improvement and after twelve years her condition is at least stationary. Her present condition is regarded as the result of an attack of encephalitis with the common involvement of the corpus stratum.

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DR. WARNER WATKINS, Box 1328, Phoenix, Arizona.....Editor in Chief
DR. F. O. BARRETT, Mills Building, El Paso, Texas.....Associate Editor
DR. C. M. YATER, Roswell, New Mexico.....Associate Editor

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TO THE DOCTORS IN NEW MEXICO WHO ARE NOT AFFILIATED WITH THE NEW MEXICO MEDICAL SOCIETY:

I have written all of you, whose names and addresses I have, several times, inviting you to align yourselves with the reputable profession by becoming members of the New Mexico Medical Society.

Some have replied and sent in applications for membership. Others, for reasons probably satisfactory to yourselves, have not; more than likely it is only a matter of procrastination, you thinking and intending to do this, but you either forget it or keep on putting it off. To these I will say that I would gladly write each of you repeatedly if it were necessary to get you in; still, if you take the proper view of the matter it seems to me that one invitation should be sufficient.

It is hard to understand how any reputable physician will deliberately isolate himself from the rest of the profession. It is very easy to account for the attitude of disreputable and unethical men in this matter, but why those who claim to be up-to-date should take this attitude is beyond me.

Last year there were about seventy physicians who became affiliated with us, men who had not heretofore been identified with organized medicine. There are still about fifty or sixty doctors in the state who should align themselves with organized medicine.

It is my earnest desire to enlist every one of you who make any claim to being reputable physicians.

The admittance fee is only $5.00, which must accompany your application, and this fee also pays annual dues for 1925 and sends you the organization journal, Southwestern Medicine, free. I think you will agree with me that the journal alone is worth more than the dues.

If you have mislaid the blank application I sent you, just drop me a line indicating that you desire to align yourself with the New Mexico Medical Society and help fight the battles of organized medicine and I will at once blaze the way for your admittance.

Do not stay aloof and let the balance of us do all the fighting while you reap your share of the benefits of the victory.

At any rate, write me, even if you still decline, so I will know just where to place you and not bother you again.

Fraternally,

C. M. YATER,

Secretary, New Mexico Medical Society.

ST. JOSEPH'S HOSPITAL STAFF MEETING

(Phoenix, Arizona)

The Medical Staff of St. Joseph's Hospital resumed their regular monthly meetings on Saturday evening, October 4, with a study of the thirty-two histories which formed the basis of the criticisms of the clinical records by a recent visitor from the College of Surgeons. Some of these histories were excellent, some indifferent and some hardly deserved the name of clinical record. Twenty-five members of the staff were present, and sixteen histories were reviewed, a brief resume of the faults found being as follows:

Case 1. Tuberculosis. Personal history indicated the diagnosis, as it should. The physical examination recorded conclusions and not the physical signs, this being the chief fault of the record.

Case 2. Incomplete abortion. Fair history of illness, but physical findings gave conclusions instead of findings. Progress record not kept by doctor.

Case 3. History says appendix and one tube removed by previous operation; operative record this time says buried appendix and bilateral appendectomy done. No explanation of discrepancy. Under "patient's complaint", the doctor's diagnosis is given. Progress record not kept by doctor.

Case 4. Chronic appendicitis. Fairly good, though brief, history. Physical findings not very complete. Other records O. K.

Case 5. Personal history fair; physical examination says "arteriosclerosis" without any physical findings charted; diagnosis of myocardial degeneration. Incomplete record.

Case 6. Hernia. Personal history brief and thought by some critics incomplete. Diagnosis given under "Physical Examination", instead of the signs present.

Case 7. Typhoid, with death. Incomplete physical findings, without any statement regarding the cardinal signs of typhoid. Diagnosis based on laboratory findings which pathologist did not consider conclusive. No progress record, though patient died in hospital.

Case 8. Endometritis, salpingitis and laceration. History and physical findings incomplete and no progress record. Nothing in record to indicate cause of the abortion.

Case 9. Mastoiditis. Fairly good history and examination record, but incomplete progress sheet.

Case 10. Tonsilitis. Incomplete record as to cause for removal of tonsils.

Case 11. Stricture of ureter. Imperfect history of complaint; no physical examination record; no record of cystoscopic findings; no progress sheet kept.

Case 12. Encephalitis. Interesting case recalled by several of the doctors present. No history of illness, patient's history or record of any physical examination. No record of the findings of several consultants. Nothing in history to indicate the reason for the diagnosis.

Case 13. Corneal ulcer. No history of the case, no physical examination or progress sheet. Doctor stated he had a complete record in his office, but has not up to now made it a practice to transfer office records to the hospital.

Case 14. Tonsilitis. Only entry is "hypertrophy" of tonsils. No record of the reason for operating.

Case 15. Septicemia of hand. No history of the infection or record of any physical examination. No progress record showing what happened in the hospital.

Case 16. Nephrosis. Very imperfect history, telling nothing of value. No physical examination. No progress record. Several laboratory sheets, but nothing connecting these with the diagnosis.

Discussion of these clinical records was quite animated, and it was decided that, at the next meeting, the six most complete histories would be selected for clinical discussion, and the six worst records would be brought forward for criticism and study of how they could be improved.

A number of lantern slides of pyelographic examinations made recently in the hospital Urological Department were shown, and the pathological findings discussed.

W. WARNER WATKINS,
Secretary.

THE ARIZONA DEACONESS HOSPITAL STAFF MEETING

(Phoenix, Arizona)

The Arizona Deaconess Hospital, Phoenix, Arizona, held its annual meeting on Saturday evening, October 25. It was featured by a complimentary dinner tendered by the hospital, attended by thirty members of the staff and several members of the Board of Directors.

Following the dinner, the Staff adjourned to the regular meeting place in the Board of Directors' room, the chief order of business being the annual election of officers.

Dr. W. C. Ellis, the retiring Chairman of the Staff, thanked the members of the Staff for their cordial support of the hospital and of the Medical Staff organization during the past year, and stated that he was not a candidate for re-election, preferring to let someone else have the grief for the coming term. Informal ballot resulted in the election of Dr. George E. Goodrich as Chairman of the Staff, the only other member sharing in the votes being Dr. John Wix Thomas, who had, however, previously requested his friends not to support him for the office, as he was not anxious for the responsibility this year.

In the selection of the Secretary of the Staff, it was necessary to take three ballots in order to decide the contest between Dr. H. L. Goss, the present secretary, and Dr. O. H. Brown. On the final ballot, Dr. Brown was elected by a majority of two votes.

A resolution was introduced and passed by the Staff requesting the Board of Directors of the hospital to modify their by-laws in such a way as to make the Chairman of the Staff a member ex-officio of the Board of Directors, in order that a liaison be formed between the governing board of the hospital and the medical organization.

An amendment to the by-laws of the Staff was presented to be voted upon at the next meeting, providing that a Program Committee be established, to consist of the secretary, the hospital pathologist and the chairman of the Records Committee, to formulate from the records programs for the staff meetings.

The superintendent of the hospital, Mr. John A. Bowman, having recently resigned, the following resolution was introduced and passed by a viva voce vote of the Medical Staff:

"Whereas, Mr. John A. Bowman, Superintendent of the Deaconess Hospital, has tendered his resignation, to take effect in the near future; and,

Whereas, the members of the Medical Staff have worked in close co-operation with him during the past year and are intimately acquainted with his efforts in building up the organization of the Hospital, and with the efficient management of the surgical departments as conducted by Mrs. Bowman; and,

"Whereas, we believe that Mr. and Mrs. Bowman have accomplished a magnificent piece of constructive work in building this Hospital into a Class A institution within the short period of one year;

"Be it, therefore, Resolved, That we, the Medical Staff of the Deaconess Hospital hereby express our sincere appreciation of their efforts and accomplishments, and heartily commend them to any hospital which may be fortunate enough to secure their services.

"Passed by unanimous vote of the Medical Staff, at their annual meeting, October 25th, 1924, with thirty-five members present."

A vote of thanks to the hospital for their entertainment at dinner was passed by a rising vote.

W. W. W.

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ARIZONA DEACONESS HOSPITAL (Phoenix) HAS NEW SUPERINTENDENT

The announcement of the resignation of Mr. John A. Bowman as superintendent of the Deaconess Hospital, at Phoenix, was received with surprise and regret by the medical profession of Maricopa County. Mr. Bowman's experience and ability in organizing hospital work was shown by the fact that within the short period of one year after he had taken charge, the hospital was accepted as a Class A institution by the College of Surgeons, an accomplishment which can hardly be excelled. This success was largely due, also, to Mrs. Bowman, who had general charge of the surgical work in the hospital, and, during much of the time, was in personal charge as chief surgical nurse.

The hospital was fortunate in having at hand a capable successor in the person of Mrs. J. O. Sexson, formerly Miss Runyan, who came to Phoenix several years ago to take charge of the hospital, but its completion being delayed, she returned east. Later she married Mr. J. O. Sexson, now chairman of the Board of Directors of the hospital, and returned to Phoenix. She was formerly superintendent of Flower Hospital in Toledo, Ohio. She was induced to take over the superintendency of the hospital for the coming year. Mr. J. O. Sexson will act as business manager of the institution, his connection on the Board of Directors having given him a knowledge of the business affairs of the institution which eminently fits him for this position.

The medical men of Phoenix who became acquainted with Miss Runyan, when she formerly came here and conferred with them about the hospital work, will welcome the opportunity to work with her again in continuing the excellent work at the Deaconess started by Mr. and Mrs. Bowman.

DR. JEREMIAH METZGER of Tucson was the accredited representative of the National Tuberculosis Association of the United States of America at the meeting of the International Union Against Tuberculosis, which was held at Lausanne, Switzerland, August 5 and 7. Dr. Metzger is Medical Director of the Tucson-Arizona Sanitarium, and returned about September 1 from attendance at this convention, which was the fourth conference of the International Union.

THE SOUTHERN CALIFORNIA MEDICAL ASSOCIATION, whose annual meeting was scheduled to take place November 7 and 8, has changed its dates to November 14 and 15. This meeting will be in Los Angeles, and members of the medical profession of the Southwest are cordially invited to attend. The secretary is Dr. Charles T. Sturgeon, 1136 West Sixth street, Los Angeles. Dr. Sturgeon is well known in Arizona, where he formerly practiced. Dr. W. L. Brown of El Paso is on the program of this Association.

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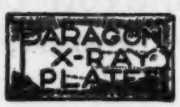

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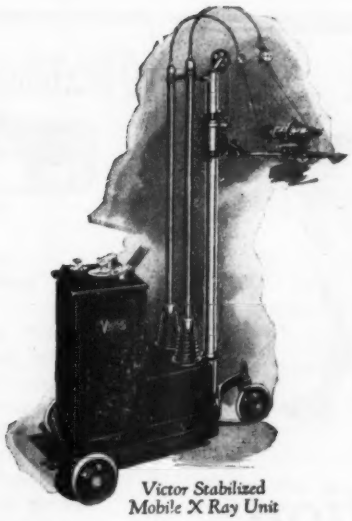

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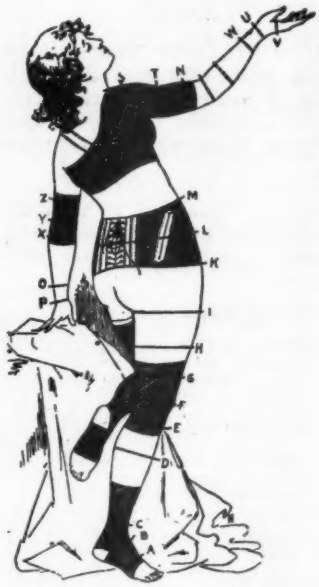

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DR. ALVIN T. KIRMSE, formerly of Globe, Ariz., later associated with Dr. Hugh Crouse of El Paso, and recently located in Milwaukee, Wis., has become associated with the Thomas-Davis Clinic in Tucson, and announces that he will practice obstetrics and pediatrics with that group.

DR. WILLARD SMITH of Phoenix has returned from his postgraduate tour of the middle west and east. He has visited the Mayo Clinic, Dr. Farr's clinic in Minneapolis, clinics in Philadelphia, New York and Chicago. The Congress of Surgery and the College of Surgeons in New York, the middle of October, was the chief attraction, and following this he has gradually found his way back to Arizona.

DR. E. W. PHILLIPS, resident physician of St. Luke's Home, Phoenix, has returned and taken up his work, after a vacation of a month of two, which was spent in northern Arizona. As previously announced, during his absence Dr. E. A. Gatterdam of the Fort Whipple staff has been supplying as sanitarium physician for St. Luke's.

DIPHTHERIA IN GRAHAM COUNTY (Arizona)

The public health officers of Thatcher and other points in Graham County are just completing a general immunization of the pupils of the Thatcher public schools, the Eden and

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MARICOPA COUNTY MEDICAL SOCIETY ENTERTAINED BY DR. WOODALL

On the evening of October 18 the Maricopa County Medical Society were the guests of Dr. Woodall at his newly completed sanitarium on North Central avenue, in Phoenix.

Twenty-six members of the society gathered there for dinner as the guests of the sanitarium, the dinner proving to be a five-course banquet for the main crowd and six courses for a selected few who remained for a post-prandial session.

Following the dinner and before the extra session mentioned, Dr. H. T. Bailey described the work he engaged in at the Postgraduate School in New York the past summer, and the various new things he learned about eye, ear, nose and throat diseases.

Dr. J. M. Greer of Mesa then described his experiences at the Cleveland Clinic and in the clinics of other surgeons in Cleveland. The organization of the Crile (or Cleveland) Clinic was given in some detail. Dr. Greer was convinced that, with the exercise of sufficient attention to the cases, any physician could give the service to his patients which would make it unnecessary to send any of them to such clinics.

DR. JAMES THOM, formerly of Jerome, Ariz., now in charge of the X-ray Department of the University of California Hospital, in San Francisco, was a visitor in Phoenix the last of October.

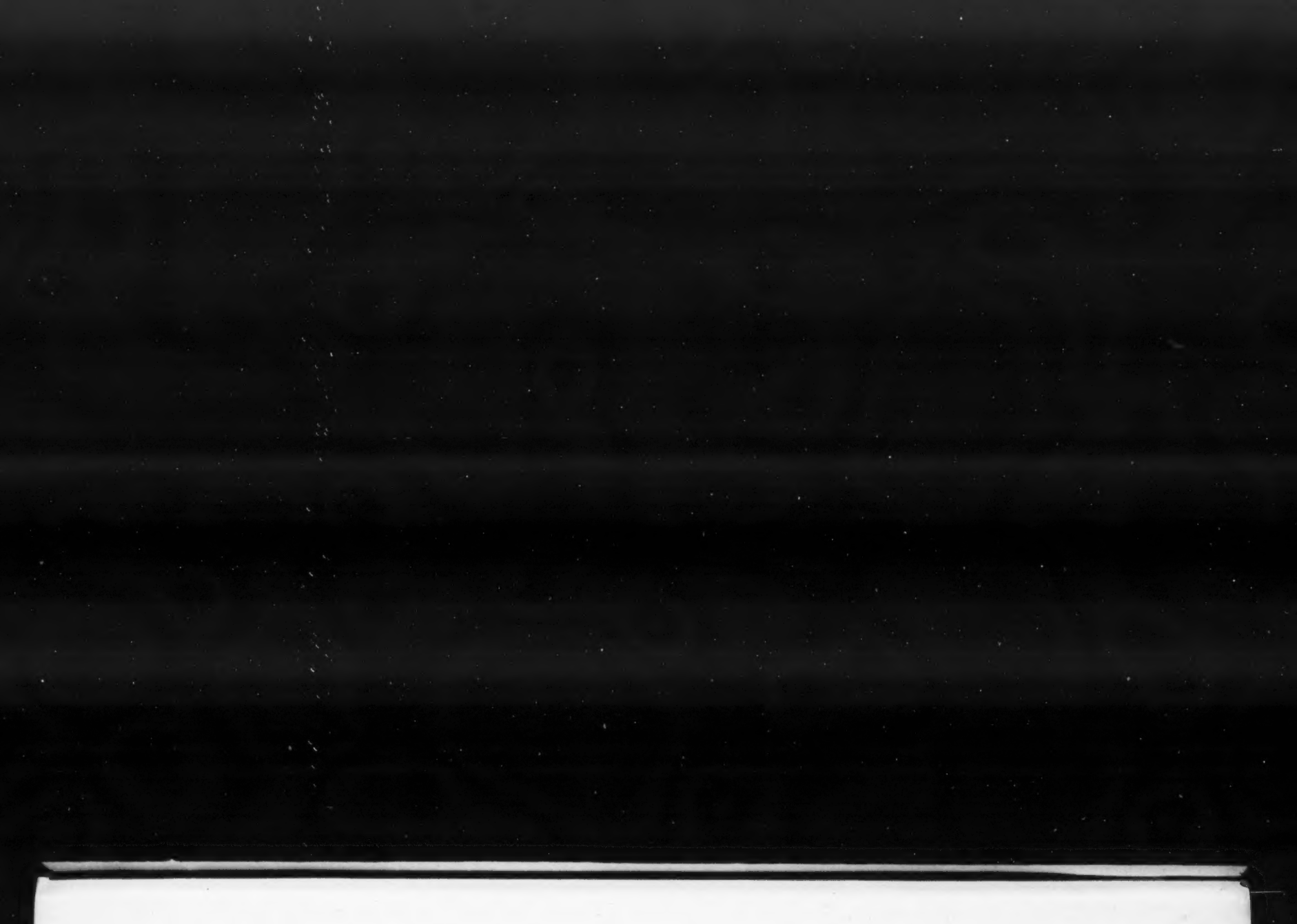
DR. FRED HOLMES of Phoenix has moved his offices from the second floor to the fourth floor of the Goodrich Building. He will have joint reception room with Drs. Harbridge, Tuthill and Gudgel.

DR. A. C. CARLSON of Jerome has just returned from an eastern trip, which included the meeting of the Congress of Surgery and College of Surgeons in New York.

DR. R. D. KENNEDY of Globe is reported to have returned from his usual visit to the College of Surgeons' meeting in New York.

IMMUNIZATION OF INDIANS AGINST DIPHTHERIA

The Indian Service is said to have ordered all the Indians in the Government schools of Arizona to be immunized against diphtheria with toxin-antitoxin. Dr. J .E. Stroud of Tempe is immunizing the Indian pupils of the McDowell Reservation.



THE CHIEF REASON

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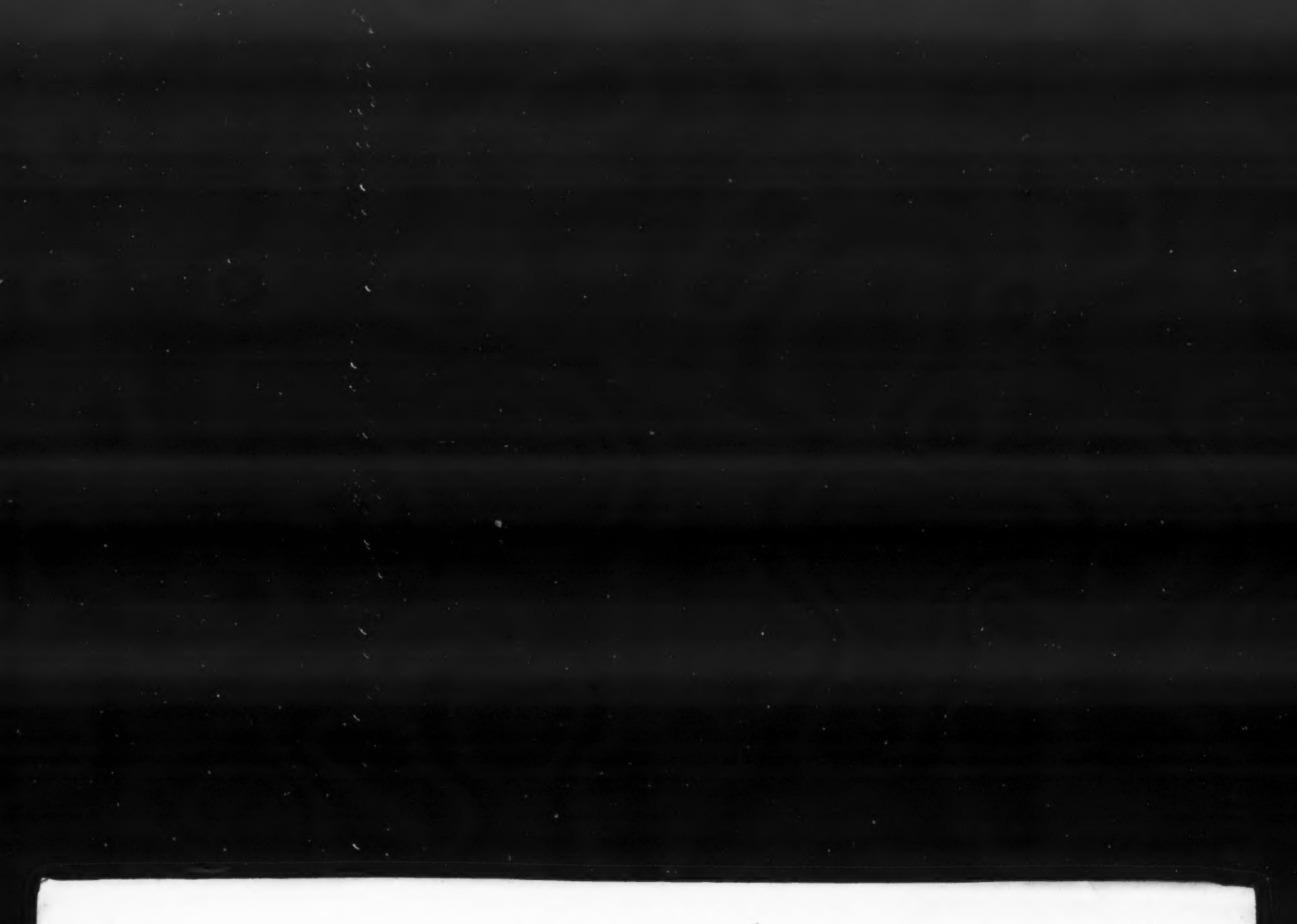
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